Vol. 1001 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 30, 1980

U.S.
DEPARTMENT
F COMMERCE

Patent
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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

December 30, 1980 Volume 1001 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
June 17, 1980. *Commissioner of Patents and Trademarks.*

Closing of Patent and Trademark Office on Friday, December 26, 1980

In view of the provisions of Executive Order 12255, issued December 5, 1980, which closes all executive departments and agencies and excuses their employees from duty on Friday, December 26, 1980, that day constitutes "a holiday within the District of Columbia" under the provisions of 35 U.S.C. 21. Any action or fee due in the Patent and Trademark Office on December 26, 1980, is to be considered timely if taken or paid on December 29, 1980.

SIDNEY A. DIAMOND,
Dated: Dec. 8, 1980. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

2,588,234, Devex Corporation, METHOD OF DRAWING METAL; Re. 24,017, same, METHOD OF COATING AND DRAWING METAL AND COMPOSITION THEREFOR, **filed** July 21, 1965, D.C. Del. (Wilmington), Doc. 3058, *Devex Corp.* v. *General Motors Corp.* Stipulation and final judgment filed Oct. 6, 1980.

3,150,840, Minnesota Mining and Manufacturing Co., TAPE CARTRIDGE, **filed** Feb. 27, 1978, D.C. S.D.N.Y., Doc. 78–C–881, *Minnesota Mining and Manufacturing Co.* v. *Microfilm Products, Inc.* Consent judgment filed Sept. 29, 1980.

3,236,700, Bandag, Inc., TIRE RECAPPING PROCESS; Reg. No. 693,857 (BANDAG AND DESIGN), Bandag Inc.; Reg. No. 802,251 (BANDAG), Bandag Inc.; Reg. No. 806,121 (BANDAG AND DESIGN), Bandag Inc.; Reg. No. 812,106 (BANDAG), Bandag Inc., **filed** Sept. 30, 1980, D.C. Colo. (Denver), Doc. 80–M–1313, *Bandag, Inc.* v. *Centennial State Retread, Inc.*

3,246,082, Telephone Hold Systems Corp., TELEPHONE HOLD PROGRAM SYSTEM, **filed** Oct. 17, 1980, D.C., N.D.N.Y. (Utica), Doc. 80–CV–842, *Telephone Hold Systems Corp.* v. *DND Teletronics, Inc.*

3,359,661, Toro Manufacturing Corporation, POWERED IMPLEMENT, **filed** Feb. 8, 1978, D.C. Del. (Wilmington), Doc. 78–50, *The Toro Company* v. *Jacobsen Manufacturing Company.* Final judgment and order filed Oct. 16, 1980.

3,455,127, Harry Simon, LOCK CONTROL SYSTEM, **filed** June 2, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c2775, *Harry Simon* v. *Folger Adam Company.* Cause dismissed by agreement of parties with stipulation to dismiss to follow filed on Oct. 10, 1980.

3,480,991, John C. Edwards, Sr., GIZZARD SKINNER, **filed** Oct. 15, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c5533, *John C. Edwards, Sr.* v. *Julius Drillis, doing business as G.P.R. Julius Co.*

3,550,226, University of Alabama Medical Center Foundation, TOOTH BRUSH FOR INTERPROXIMAL AREAS, **filed** Oct. 10, 1980, D.C., N.D. Calif. (San Francisco), Doc. C–80–3887 MHP, *The University of Alabama in Birmingham Medical and Educational Foundation* v. *Amera Corporation.*

3,563,399, Charles C. Shivvers, METHOD FOR CIRCULATING GRAIN STORED IN A CIRCULAR BIN; **3,765,548,** same, SWEEP AUGER STRUCTURE, **filed** Sept. 8, 1980, D.C., N.D. Iowa (Cedar Rapids), Doc. 1C–80–3045, *Charles C. Shivvers* v. *Sukup Manufacturing Company.*

3,630,505, Byron R. MacKay, SILVER RECOVERY; **3,692,291,** Michael T. MacKay, same; **3,744,995,** Byron R. MacKay, same, **filed** Dec. 21, 1979, D.C., N.D. Iowa (Sioux City), Doc. 2C–79–4100, *Byron R. MacKay et al.* v. *Robert Hoff et al.* Stipulation and consent decree filed Sept. 24, 1980.

3,637,153, King Instrument Corp., MACHINE FOR SPLICING AND WINDING TAPE INTO A CASSETTE; **3,737,358,** same, SPLICER HEAD ASSEMBLY FOR USE IN SPLICING TAPE TO LEADERS, **filed** Sept. 11, 1980, D.C., N.D. Calif. (San Francisco), Doc. C–80–3605 WAI, *King Instrument Corp.* v. *Otari Corp.*

3,671,726, Morvue, Inc., ELECTRO-OPTICAL APPARATUS FOR PRECISE ON-LINE MEASUREMENT OF THE THICKNESS OF MOVING STRIP MATERIAL, **filed** Sept. 26, 1980, D.C. Colo. (Denver), Doc. 80–A–1290, *Trienco, Inc.* v. *Morvue, Inc.*

3,692,291. (See 3,630,505.)

3,737,358. (See 3,637,153.)

3,744,995. (See 3,630,505.)

3,765,548. (See 3,563,399.)

3,792,522, Mercury Aircraft, Inc., FRAME-MAKING METHOD, **filed** Sept. 16, 1980, D.C., S.D. Ohio (Dayton), Doc. C–3–80–378, *Mercury Aircraft, Inc.* v. *International Tool Company, Inc.*

3,806,429, Oxy Metal Finishing Corporation, ELECTRODEPOSITION OF BRIGHT NICKEL-IRON DEPOSITS, ELECTROLYTES THEREFOR AND COATING AN ARTICLE WITH A COMPOSITE NICKEL-IRON CHROMIUM COATING; **3,974,044,** same, BATH AND METHOD FOR THE ELECTRODEPOSITION OF BRIGHT NICKEL-IRON DEPOSITS; **4,179,343,** same, ELECTROPLATING BATH AND PROCESS FOR PRODUCING BRIGHT, HIGH-LEVELING NICKEL IRON ELECTRODEPOSITS, **filed** Sept. 29, 1980, D.C., E.D. Mich. (Detroit), Doc. 80–73678, *Oxy Metal Industries Corporation* v. *Quin-Tec, Inc.*

3,811,414, Thunderbird Industries, Inc., HEAT EXCHANGER APPARATUS FOR PRODUCING STEAM OR THE LIKE, **filed** Oct. 8, 1980, D.C., M.D.N.C. (Greensboro), Doc. C–80–535–WS, *Thunderbird Industries, Inc.* v. *Spartan Manufacturing Corporation et al.*

3,816,002, Rohm and Haas Company, HERBICIDAL 3,4-DICHLOROANILIDES, **filed** Sept. 18, 1980, D.C. Del. (Wilmington), Doc. 80–450, *Rohm and Haas Company* v. *Vertac Chemical Corporation.*

3,829,589, Akihiro Matsunaga, METHOD OF MAKING PEANUT FLOUR; **3,901,983,** same, PROCESS FOR MAKING DEFATTED PEANUT FLOUR, **filed** Dec. 12, 1979, D.C.,

N.D. Ohio (Cleveland), Doc. C-79-2333, *Penna Protein International, Inc.* v. *Akihiro Matsunaga.* Defendant is divested of all right, title and interest in 3,829,589 and 3,901,983. Filed Sept. 18, 1980.

3,835,117, Walaschek & Associates, Inc., RUBBERIZED COAL TAR PITCH EMULSION; **3,897,380,** same, **filed** Oct. 3, 1980, D.C., S.D. Ind. (Evansville), Doc. EV-80-182-C, *Walaschek & Associates, Inc.* v. *James Donald Crow et al.*

3,853,217, Medical Laboratory Automation, Inc., PIPETTE TIP PACKAGE, **filed** June 3, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1999, *Medical Laboratory Automation, Inc.* v. *Labcon, Inc.* Patent No. 3,853,217 is invalid for obviousness. Therefore, summary judgment is granted in favor of defendant with each party bearing its own costs. Sept. 11, 1980.

3,858,873, Arthur Jones, WEIGHT LIFTING EXERCISING DEVICES; **3,998,454,** same, FORCE RECEIVING EXERCISING MEMBER; Reg. No. 991,897 (NAUTILUS), Arthur Jones; Reg. No. 1,061,003 (NAUTILUS), Arthur Jones, **filed** Oct. 16, 1980, D.C., M.D. Fla. (Orlando), Doc. 80-547-Orl-Civ-Y, *Arthur Jones, doing business as Nautilus Sports/Medical Industries* v. *The World of Fitness Center, Inc. et al.*

3,872,554, Firma Schaeffer-Homberg GmbH, CLOSURE FOR ARTICLES OF CLOTHING, VALISES, POCKETS OR THE LIKE WITH OVERLAPPING CLOSURE PARTS, **filed** June 18, 1976, D.C.N.J. (Newark), Doc. 76-1153, *Berkeley Park Clothes, Inc.* v. *Firma Schaeffer-Homberg GmbH.* Order terminating action administratively filed Sept. 26, 1980.

3,890,655, Cleo D. Mathis, WHIRLPOOL JET FOR BATHTUBS; **3,890,656,** same; **3,946,449,** same; **D. 244,462,** same, WHIRLPOOL JET NOZZLE FOR BATHTUBS AND THE LIKE, **filed** Oct. 8, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80-04481, *Cleo D. Mathis et al.* v. *Bill Spears, doing business as Waterway Plastics and Waterway Plastics, Inc.*

3,890,656. (See 3,890,655.)

3,897,380. (See 3,835,117.)

3,901,983. (See 3,829,589.)

3,917,534, Plastic Techniques, Inc., FILTER SECTOR, **filed** Feb. 19, 1980, D.C. Minn. (Duluth), Doc. 5-80-44, *Plastic Techniques, Inc.* v. *Envirotech Corporation.* Stipulation and order of dismissal filed May 30, 1980.

3,919,953, Card and Hill, APPARATUS FOR TUFTING SPACED ROWS OF LOOP PILE AND CUT PILE, **filed** June 27, 1980, D.C., E.D. Tenn. (Chattanooga), Doc. 1-80-0174, *Tuftco Corp.* v. *Spencer Wright Industries, Inc.*

3,927,504, John J. Forrister, APPARATUS AND METHOD FOR PRODUCING A COMPRESSED, ROLLED PACKAGE OF RESILIENT MATERIAL, **filed** Oct. 10, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80-04524, *John J. Forrister* v. *Medidyne, Inc., doing business as Bio Clinic Co.*

3,945,315, Lindemann Maschinenfabrik GmbH, HYDRAULIC SCRAP SHEARING MACHINE, **filed** Oct. 15, 1980, D.C., S.D. Tex. (Houston), Doc. H-80-2333, *Lindemann Maschinenfabrik GmbH* v. *American Hoist and Derrick Co.*

3,946,440. (See 3,890,655.)

3,953,062, John F. Maston, PADLOCK CLASP, **filed** Sept. 30, 1980, D.C., S.D. Calif. (San Diego), Doc. 80-1641G(M), *John F. Maston* v. *Holmes-Hally Industries et al.*

3,962,125, Coulter Electronics, Inc., MULTI-PURPOSE DILUENT FOR USE IN BLOOD ANALYSIS BY ELECTRONIC INSTRUMENTATION OF THE COULTER TYPE, **filed** June 1, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1941, *Coulter Electronics, Inc.* v. *J. T. Baker Chemical Corporation.* Defendant shall not infringe Pat. No. 3,962,125. Oct. 10, 1980.

3,974,044. (See 3,806,429.)

3,995,448, Rudolf Iversen, AIR CONDITIONING SYSTEM, **filed** June 24, 1980, D.C., W.D. Mo. (Kansas City), Doc. 80-0589-CV-W-3, *Natkin Service Company* v. *Rudolf Iversen et al.* **Same, filed** Aug. 15, 1980, D.C.N.J. (Newark), Doc. 80-2652, *Rudolf Iversen* v. *Prudential Insurance Company of America.*

3,998,454. (See 3,858,873.)

4,046,324, Joseph W. Chambers, SOLID WASTE COMMINUTOR, **filed** Sept. 26, 1980, D.C., M.D. Fla. (Tampa), Doc. 80-1085-C-T-WC, *Disposable Waste Systems, Inc. and Joseph W. Chambers* v. *Gregory J. Flament et al.*

4,053,740, Pierce and Stroud, Jr., VIDEO GAME SYSTEM, **filed** Feb. 1, 1980, D.C., S.D. Calif. (San Diego), Doc. 80-0184-T, *Cinematronics, Inc. et al.* v. *Atari, Inc. et al.* **Same, filed** Apr. 17, 1980, D.C., N.D. Calif. (San Francisco), Doc. C-80-1471 WHO, *Atari, Inc.* v. *Cinematronics, Inc.*

4,060,296, AMP Incorporated, LOW PROFILE DIP RECEPTACLE, **filed** Apr. 14, 1980, D.C., N.D. Ind. (South Bend), Doc. S-80-0103, *AMP Incorporated* v. *Wells Electronics, Inc.* Defendant is permanently enjoined from infringing plaintiff's patent. Sept. 2, 1980.

4,077,400, Roy M. Harrigan, EXTERNAL CARDIAC RESUSCITATION AID; **4,095,590,** same; **4,160,458,** same, **filed** Sept. 17, 1979, D.C. Vt. (Burlington), Doc. 80-154, *Pepin Distributing Inc.* v. *Harrigan Medical Products, Inc.* (Transferred from D.C. Del. (Wilmington), C-79-446). Order granting dismissal without prejudice with respect to all claims and counterclaims filed Sept. 12, 1980.

4,077,400, Roy M. Harrigan, EXTERNAL CARDIAC RESUSCITATION AID, **filed** Sept. 21, 1979, D.C. Vt. (Burlington), Doc. 79-219, *Roy M. Harrigan* v. *Pepin Distributing, Inc.* Stipulation for entry of discontinuance with respect to all claims and counterclaims dismissed with prejudice on Sept. 12, 1980.

4,086,939, Snap-Tite, Inc., COUPLING ASSEMBLY, **filed** Oct. 3, 1980, D.C., N.D. Ohio (Cleveland), Doc. 1843, *Snap-Tite, Inc.* v. *Gould, Inc. et al.*

4,090,372, J & C Lamb Corporation, FUEL CONSERVATION CONTROLLER FOR CAPACITY CONTROLLED REFRIGERATION APPARATUS; **4,202,181,** same, FUEL CONSERVATION CONTROLLER FOR HEATING AND REFRIGERATION APPARATUS, **filed** May 27, 1980, D.C.N.J. (Newark), Doc. 80-1530, *J & C Lamb Corporation* v. *Thermo Engineering, Inc.*

4,095,590. (See 4,077,400.)

4,097,952, Robert J. Lindstrom, MOPS OF CELLULOSE SPONGE CLOTH MATERIAL, **filed** July 18, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80-2829, *Zephyr Manufacturing Company of Sedalia, Mo.* v. *Norman Liebowitz, doing business as Norshal Industries.*

4,106,628, Warkentin and Mills, SORTER FOR FRUIT AND THE LIKE, **filed** Sept. 26, 1980, D.C., N.D. Ga. (Atlanta), Doc. C-80-1686A, *Pennwalt Corp.* v. *Durand Wayland, Inc.*

4,121,891, Guy W. Barron, TAPE PLAYER CLEANING DEVICE, **filed** May 22, 1980, D.C., S.D. Miss. (Jackson), Doc. J-80-0234(N), *Guy W. Barron* v. *Radio Shack.* Cause dismissed with prejudice. Oct. 2, 1980.

4,133,685, Richardson Graphics Company, LITHOGRAPHIC PLATE AND PHOTORESIST HAVING PHOTOSENSITIVE LAYERS OF DIAZO AND CINNAMOYLATED POLYVINYL ALCOHOL MATERIALS, **filed** July 9, 1980, D.C., W.D. Tenn. (Jackson), Doc. 80-1089, *Richardson Graphics Company* v. *Citiplate, Inc. et al.* Final judgment filed Oct. 1, 1980.

4,136,699, H. B. Fuller Company, ABSORBENT ARTICLE WITH ADHESIVE STRIP, **filed** Sept. 22, 1980, D.C. Del. (Wilmington), Doc. 80-454, *H. B. Fuller Company* v. *National Starch & Chemical Corp.*

4,137,299, Joseph P. DiMaggio, Jr., BIOLOGICAL STAINING COMPOSITION AND STAINING METHOD, **filed** May 28, 1980, D.C., M.D. Fla. (Orlando), Doc. 80-258-Orl-Civ., *AJP Scientific, Inc.* v. *Bioscientific Co. et al.* **Same, filed** Feb. 8, 1980, D.C.N.J. (Newark), Doc. 80-361, *AJP Scientific, Inc.* v. *Fisher Scientific Co., Inc. et al.* Order transferring action to D.C., M.D. Fla. filed Oct. 24, 1980.

4,146,602, Becton, Dickinson & Company, SIMULTANEOUS RADIOASSAY OF FOLATE AND VITAMIN B_{12}, **filed** Apr. 27, 1979, D.C., N.D. Calif. (San Francisco), Doc. C-79-1016 CFP, *Becton, Dickinson & Company* v. *Bio-Rad Laboratories, Inc.* Order of dismissal with prejudice filed Oct. 10, 1980.

4,146,151, Lever Brothers Company, MOUTHWASH, **filed** June 30, 1980, D.C., S.D.N.Y., Doc. 80-C-3724, *Lever Bros.* v. *Warner-Lambert.*

4,152,986, Dadowski, Mahr and Drachman, METHOD AND APPARATUS FOR PRINTING RAISED INK IMAGES, **filed** Sept. 28, 1979, D.C., S.D. Ohio (Dayton), Doc. C-3-79-

357, *Spirit Gravure Company* v. *The Mazer Corp.* Case transferred to W.D. Pa. (Pittsburgh) on April 9, 1980.

4,154,384, Juanita Carver, LATCH HOOKING YARN DISPENSER, **filed** Sept. 26, 1980, D.C. Ariz. (Phoenix), Doc. 80–782 VAC, *Carver Corp. and Juanita Carver* v. *Crown Crafts Int. et al.*

4,162,338, Schwarzkopf Development Corporation, COATED CEMENTED CARBIDE ELEMENTS AND THEIR MANUFACTURE, **filed** July 25, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–1021, *Schwarzkopf Development Corporation* v. *Kennametal Inc.* Action dismissed with prejudice and without costs to either party on June 1, 1980.

4,162,792, Mattel, Inc., OBSTACLE GAME, **filed** Sept. 14, 1979, D.C., S.D.N.Y., Doc. 79–C–4909 (LPG), *Coleco Industries, Inc.* v. *Mattel, Inc.* **Same, filed** Nov. 29, 1979, D.C., S.D.N.Y., Doc 79–C–6425 (LPG), *Mattel, Inc.* v. *R. H. Macy's & Co. Inc. et al.* **Same, filed** Nov. 29, 1979, D.C., S.D.N.Y. Doc. 79–C–6426 (LPG), *Mattel, Inc.* v. *Barkers and Cardinal Industries, Inc.* **Same, filed** Nov. 29, 1979, D.C., S.D.N.Y., Doc. 79–C–6427 (LPG), *Mattel, Inc.* v. *F. J. Strauss Co., Inc.* **Same, filed** Nov. 29, 1979, D.C., S.D.N.Y., Doc. 79–C–6428 (LPG), *Mattel, Inc.* v. *Miller-Spence, Inc.* **Same, filed** Dec. 10, 1979, D.C., S.D.N.Y., Doc. 79–C–6699 (LPG), *Mattel, Inc.* v. *Miller-Sperber, Inc.*

4,166,458 (See 4,077,400.)

4,166,460, Philip O. Littleford, APPARATUS AND METHOD FOR INSERTING AN ELECTRODE, **filed** May 19, 1980. D.C., M.D. Fla. (Orlando), Doc. 80–238–Orl–Civ–Y, *Philip O. Littleford, M.D. et al.* v. *Larry Junker et al.*

4,170,929, James E. McDowell, APPARATUS FOR SETTING UP FOLDED CARTONS, **filed** Oct. 1, 1980, D.C., E.D. Calif. (Fresno), Doc. CV–F–80–224–MDC, *Maxco Supply, Inc.* v. *McDowell International Packaging Systems, Inc.*

4,179,152, James K. Kent, Jr., METHOD AND APPARATUS FOR SECURING FABRIC TOPS TO A VEHICLE, **filed** Sept. 26, 1980, D.C. Colo. (Denver), Doc. 80–K–1289, *James K. Kent, Jr.* v. *Bestop Manufacturing, Inc.*

4,179,843. (See 3,806,429.)

4,187,390, W. L. Gore & Associates, Inc., POROUS PRODUCTS AND PROCESS THEREFOR, **filed** Feb. 7, 1980, D.C., N.D. Ohio (Cleveland), Doc. C–80–174, *W. L. Gore & Associates, Inc.* v. *Garlock, Inc.*

4,188,876, Donald J. Graves, JUNK METAL COMPRESSOR, **filed** Oct. 1, 1980, D.C., N.D. Ind. (Fort Wayne), Doc. F–80–0190, *Donald J. Graves et al.* v. *The Kemsco Group, Inc. et al.*

4,191,376, System Operations, Inc., HIGHLY SECURE PLAYING CARDS FOR INSTANT LOTTERY AND GAMES, **filed** June 4, 1980, D.C., E.D. Mich. (Detroit), Doc. 80–72068, *System Operations, Inc.* v. *Scientific Games Development Corp. et al.* Action dismissed without prejudice and without costs to either party. Sept. 16, 1980.

4,192,725, Diamond Shamrock Corporation, ELECTROLYTIC PRODUCTION OF HIGH PURITY ALKALI METAL HYDROXIDE, **filed** Mar. 11, 1980, D.C., E.D. Okla. (Muskogee), Doc. 80–89–C, *Diamond Shamrock Corporation* v. *Fort Howard Paper Company et al.* **Same, filed** Mar. 27, 1980, D.C. Del. (Wilmington), Doc. 80–137, *E. I. du Pont de Nemours and Company, Inc.* v. *Diamond Shamrock Corporation.*

4,196,553, Clifton R. Veach, END JOINING PIECE ADAPTABLE TO EITHER HOLLOW OR INSULATED BACKING SIDING, **filed** Sept. 24, 1980, D.C., S.D. Ohio (Columbus), Doc. C–2–80–814, *Clifton R. Veach, doing business as Creative Products Co.* v. *Vipco Inc.* **Same, filed** Sept. 24, 1980, D.C., S.D. Ohio (Columbus), Doc. C–2–80–815, *Clifton R. Veach, doing business as Creative Products Company* v. *Certainteed Corporation.*

4,196,570, Henry Rodriguez, MECHANIZED HARVESTING MACHINE, **filed** Aug. 15, 1980, D.C. N. Mex. (Albuquerque), Doc. 80–668–HB, *Henry Rodriguez* v. *Don House, doing business as House & Sons Welding.*

4,196,662, Jack R. Paden, SMOKING DEVICE, **filed** June 9, 1980, D.C. Nebr. (Omaha), Doc. 80–0–375, *Jack R. Paden* v. *Elmer A. Wessel et al.*

4,201,395, Vanguard Manufacturing, Inc., ROLLER SKATE SHOE TOE GUARD, **filed** Aug. 18, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03635, *Vanguard Manufacturing, Inc.* v. *Ornate Designs, Inc.*

4,202,632, Troller Corporation, POWER CONTROL CIRCUIT, **filed** Aug. 1, 1980, D.C.N.J. (Trenton), Doc. 80–2471, *Model Rectifier Corporation* v. *Troller Corporation.*

4,202,181. (See 4,000,372.)

4,217,986, Donald M. Brown, INVENTORY RESTRAINING DEVICE FOR MERCHANDISE DISPLAY HOOK, **filed** Sept. 9, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03914 AWT, *Donald M. Brown* v. *Trion Industries, Inc.*

Re. 24,017. (See 2,588,234.)

Re. 25,820, John Macchione, METHOD OF AND APPARATUS FOR PRODUCING TUBES OF POLYGONAL CROSS SECTION, **filed** Oct. 2, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c5299, *John Macchione* v. *Precision Paper Tube Co.*

Re. 28,066, Walter Marcyan, SINGLE-STATION MULTIPURPOSE BODY-EXERCISING MACHINE, **filed** Oct. 9, 1980, D.C., N.D. Ind. (South Bend), Doc. S–80–0322, *Walter Marcyan et al.* v. *Nissen Corporation et al.*

D. 250,662, Concept, Inc., DENTAL STAIN REMOVER, **filed** Sept. 14, 1979, D.C., S.D. Fla. (Miami), Doc. 79–4231–C–CA, *Concept, Inc.* v. *Save-Way Industries et al.*

D. 244,462. (See 3,890,655.)

Department of Commerce

PATENT AND TRADEMARK OFFICE

37 CFR Part 1

PATENT INTERFERENCE PROCEEDINGS

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed rulemaking.

SUMMARY: The Patent and Trademark Office is proposing to amend five sections and to add one additional section to its rules of practice in patent cases. Each of these sections concerns patent interference proceedings. The purpose of this action is: (1) to clarify and more specifically define the matters which may be raised before the Board of Patent Interferences at final hearing; (2) to broaden the present requirements relating to printed briefs at final hearing; and (3) to specify the manner in which discovery may be used.

DATES: Written comments must be received on or before February 4, 1981.

ADDRESSES: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. All comments received will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Ian A. Calvert, Chairman, Board of Patent Interferences, by telephone at (703) 557–3625, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: The reasons for the proposed changes are set out in the following discussion, under three headings which correspond to the purposes stated in the "SUMMARY."

(1) *Matters raised at final hearing.*—The second sentence of present § 1.258(a) contains a lengthy statement concerning consideration of the patentability of a claim. This statement appears to be superfluous and has proven to be extremely confusing even to persons well versed in interference practice. Proposed § 1.258 eliminates this problem by concisely stating that at final hearing the Board of Patent Interferences will consider only priority of invention and matters ancillary thereto.

The other proposed changes in § 1.258 arose as a result of the decision on petition for rehearing in *Peska* v. *Satomura*, 602 F.2d 969, 202 USPQ 726 (CCPA 1979), in which the court noted that § 1.258(b) did not specify certain steps which the Patent and Trademark Office requires to have occurred in order for a motion under § 1.231(a)(4) to be considered at final hearing. In order to correct this deficiency, § 1.258(a) is proposed to be rewritten to specify how matters which are ancillary to priority must have been raised in order to entitle a party to raise them at final hearing. Under the proposed provisions, matters raised in § 1.231 motions which were dismissed as procedurally defective, for example, because they were filed belately, or did not comply with the first sentence of § 1.231(b), may not be raised before the Board of Patent Interferences. However, a matter raised in

a motion which was dismissed solely because it was based on facts sought to be established by affidavits, declarations or evidence outside of official records and printed publications (as provided in § 1.231(a)(1)), or because it would require the taking of testimony (*Cory* v. *Blakey*, 1905 C.D. 116 (Comr. Pats.)), may be raised at final hearing under proposed § 1.258(a)(1)(iii).

The language of proposed § 1.258(a)(2) is taken from present § 1.225(a).

Present paragraph (b) of § 1.258 has been eliminated as redundant, since the question of benefit of a prior application is ancillary to priority, and is therefore covered under paragraph (a). Paragraph (c) of § 1.258 remains unchanged.

In view of the proposed revision of § 1.258, § 1.225(a) is proposed to be considerably simplified by merely referring to § 1.258. The provision for requesting final hearing within 30 days of the decision denying the motion has been dropped as superfluous, since the time for requesting final hearing, if appropriate, is always set by the patent interference examiner. A final sentence requiring a motion to take testimony is proposed to be added, in order to ensure that if a matter (ancillary to priority) raised in a § 1.231 motion is one which must be supported by evidence, the testimony or other evidence (e.g., under 37 CFR 1.282) necessary for consideration of the matter by the Board of Patent Interferences will be taken inter partes, in accordance with 37 CFR 1.271 et seq.

Minor changes are proposed in § 1.231(d) for the purpose of consistency with proposed § 1.258.

None of the proposed changes in §§ 1.225(a), 1.231(d) or 1.258 is intended to alter the existing practice, except for the last sentence of proposed § 1.225(a), which makes mandatory a step which good practice dictates should be taken under present procedure but often is not.

(2) *Printed briefs.*—Under present §§ 1.253 and 1.254, testimony and briefs for final hearing filed in interferences must, if printed, comply with the requirements of § 1.253(e), which have consistently been interpreted as requiring standard typographic printing. Since the Court of Customs and Patent Appeals accepts as "printed" briefs produced by other processes, it is considered that the Patent and Trademark Office should follow suit, in order to spare interference parties the present onerous cost of typographic printing. § 1.253(e) is therefore proposed to be amended to conform it more closely to Rule 5.8(a) of the Court of Customs and Patent Appeals. A sentence, based on Court of Customs and Patent Appeals Rule 5.8(e), is proposed to be added to § 1.254 in order to permit the Board of Patent Interferences to accept, in its discretion, a brief which may not literally comply with the rules, but is otherwise considered satisfactory.

(3) *Use of discovery.*—When § 1.287 was adopted in 1971, no particular provision was made in the rules for the introduction and use as evidence of items obtained through discovery. This has led to some disagreement and confusion on the subject. Compare, for example, the majority and concurring opinions in *Inoue* v. *Lobur*, 195 USPQ 256 (Bd. Pat. Int. 1976).

Proposed new § 1.288 is intended to remedy this situation. Paragraph (a) of the rule is analogous to § 1.282, and permits a party to an interference who has obtained, through discovery related to the interference, admissions in writing in response to written requests for admissions, or written answers to written interrogatories, to introduce the admissions or answers into evidence without taking testimony. The term "discovery" is intended to include discovery conducted voluntarily between the parties or in a court, as well as discovery under § 1.287.

Paragraph (b) of the proposed section specifies that other matter obtained by discovery must be introduced in the same manner as other evidence; for example, documents obtained by discovery must be introduced as indicated in *Clark* v. *Wilke*, 203 USPQ 1101 (Bd. Pat. Int. 1978), and testimony taken in an ancillary proceeding under the control of a U.S. District Court must be introduced in accordance with § 1.283 (Commissioner's Notice of May 2, 1972, 898 O.G. 1500).

Pursuant to 35 USC 6(a), as amended, the Commissioner of Patents and Trademarks proposed to amend Title 37 of the Code of Federal Regulations by amending the §§ 1.225, 1.231, 1.253, 1.254 and 1.258, and by adding a new § 1.288, as shown below. The Patent and Trademark Office has determined that these rule changes have no potential major economic consequences requiring the preparation of a regulatory analysis under Executive Order 12044.

It is proposed to amend 37 CFR, Chapter I, Subchapter A, Part 1, as follows:

1. By revising paragraph (a) of § 1.225 to read as follows:

§ 1.225 *Failure of junior party to file statements or to overcome filing date of senior party.*

(a) If a junior party to an interference fails to file a preliminary statement, or if his statement fails to overcome the effective filing date of another party, judgment on the record will be entered against that junior party unless:

(1) Under the provisions of § 1.258(a), he would be entitled to raise before the Board of Patent Interferences a matter which is ancillary to priority and which, if decided in his favor, would remove the basis for judgment on the record against him, and

(2) Within a time set by the patent interference examiner, not less than 30 days, he requests that final hearing be set to review such matter. If the matter was raised in a motion which was dismissed for one of the reasons specified in § 1.258(a)(1)(iii), the request for final hearing must be accompanied by a motion to take testimony under paragraph (b) of this section.

* * * * *

2. By amending paragraph (d) of § 1.231 as follows (additions are indicated by arrows, deletions by brackets):

§ 1.231 *Motions before the primary examiner.*

* * * * *

(d) All proper motions as specified in paragraph (a) of this section, or of a similar character, will be transmitted to and considered by the primary examiner without oral argument, except that consideration of a motion to dissolve ►on a ground other than no interference in fact◄ will be deferred to final hearing before a Board of Patent Interferences where the motion [urges unpatentability of a count to one or more parties] ►raises a matter◄ which would be reviewable at final hearing under § 1.258(a) and such [unpatentability is urged] ►matter is raised◄ against a patentee or has been ruled upon by the Board of Appeals or by a court in ex parte proceedings. Also consideration of a motion to add or remove the names of one or more inventors may be deferred to final hearing if such motion is filed after the times for taking testimony have been set. Request for reconsideration will not be entertained.

3. By revising paragraph (e) of § 1.253 to read as follows:

§ 1.253 *Copies of the testimony.*

* * * * *

(e) When the copies of the testimony are submitted in printed form, they may be produced by standard typographic printing or by any process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Margins must be justified. Footnotes may not be printed in type smaller than 9 point. The page size shall be either 7⅝ by 10¼ inches (19.4 by 26 cm.) with type matter 4⅛ by 7⅛ inches (10.6 by 18.2 cm.), or 8½ by 11 inches (21.6 by 27.9 cm.) with type matter 6½ by 9½ inches (16.5 by 24.1 cm.). The testimony shall be bound to lie flat when open. Plastic and metal ring-type bindings are not acceptable. Twenty-five additional copies for the United States Court of Customs and Patent Appeals, should appeal be taken, may also be filed; if no appeal be taken, the twenty-five copies will be returned to the party filing the testimony.

* * * * *

4. By adding the following sentence to § 1.254:

§ 1.254 *Briefs at final hearing.*

* * * The board may refuse to accept any brief which has been printed, typewritten, or bound otherwise than in substantial conformity with this section.

5. By revising § 1.258 to read as follows:

§ 1.258 *Matters considered in determining priority.*

(a) In determining priority of invention, the Board of Patent Interferences will consider only priority of invention on the evidence submitted, and matters ancillary thereto. A party shall be entitled to raise a matter which is ancillary to priority only if:

(1) The matter was raised by the party in a motion under § 1.231(a), and:

(i) The motion was transmitted to and decided by the primary examiner; or

(ii) Consideration of the motion was deferred to final hearing; or

(iii) The motion was dismissed as being based on facts sought to be established by affidavits, declarations or evidence outside of official records and printed publications, or as being based on a ground which would require the taking of testimony; or

(2) The matter was raised by the party in opposition to a motion under § 1.231(a)(2), (3), (4) or (5) which was granted over his opposition; or

(3) The party shows good reason why the matter was not raised as specified in paragraphs (a)(1) or (2) of this section.

(b) To prevent manifest injustice the Board of Patent Interferences may in its discretion consider a matter which is ancillary to priority even though it would not otherwise be entitled to consideration under paragraph (a) of this section.

(c) At final hearing between an application and a patent the prior art of record in the patent file may be referred to for the purpose of construing the issue.

6. By adding the following new section:

§ 1.288 *Use of discovery.*

(a) If a party intends to rely upon an admission or upon an answer to an interrogatory, obtained by discovery, the admission or answer may be introduced into evidence by filing, before the closing of the time for taking the testimony of the party (before the time for taking the testimony in chief if such admission or answer is not in rebuttal), a copy of the admission and the request therefor and/or a copy of the interrogatory and its answer, together with a notice of reliance thereon.

(b) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence pursuant to §§ 1.271 to 1.286.

SIDNEY A. DIAMOND,
Dated: Oct. 15, 1980 *Commissioner of Patents and Trademarks*

Approved:

JORDAN J. BARUCH,
Dated: Oct. 31, 1980 *Assistant Secretary for Productivity, Technology and Innovation*

[FR Doc. 80-36675 Filed 11-24-80; 8:45 am]

Board of Appeals Decisions Rendered in the Month of November 1980

Affirmed	120
Affirmed in Part	17
Reversed	46
Total	183

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,776,781, Re. S.N. 188,556, Filed Sep. 18, 1980, Cl. 136/239, THERMOCOUPLE WITH NICKEL-SILICON-MAGNESIUM ALLOY NEGATIVE ELEMENT, Carrol Dean Starr, et al., Owner of Record: *Amax Inc., Greenwich, Conn.,* Attorney or Agent: Eugene J. Kalil, Ex. Gp.: 223

3,820,983, Re. S.N. 188,555, Filed Sep. 18, 1980, Cl. 75/170, NICKEL-SILICON-MAGNESIUM ALLOY, Carrol Dean Starr, et al., Owner of Record: *Amax Inc., Greenwich, Conn.,* Attorney or Agent: Eugene J. Kalil, Ex. Gp.: 111

3,887,557, Re. S.N. 190,053, Filed Sep. 23, 1980, Cl. 424/251, ANTIBACTERIAL PHARMACEUTICAL COMPOSITIONS AND PROCESSES FOR PREPARATION THEREOF, Shinsaku Minami, et al., Owner of Record: *Dainippon Pharmaceutical Co., Ltd., Osaka, Japan,* Attorney or Agent: Leonard W. Sherman, et al., Ex. Gp.: 125

4,036,632, Re. S.N. 166,921, Filed Jul. 7, 1980, Cl. 71/93, HERBICIDAL AGENTS, Kurt Westphal, et al., Owner of Record: *Farbenfabriken Bayer AG, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 122

4,079,584, Re. S.N. 192,059, Filed Sep. 29, 1980, Cl. 59/35 R, HEAVY DUTY SHACKLE, James B. Shahan, Owner of Record: *American Hoist & Derrick Company, Tulsa, Okla.,* Attorney or Agent: James R. Head, et al., Ex. Gp.: 321

4,111,724, Re. S.N. 183,100, Filed Sep. 2, 1980, Cl. 148/175, METHOD OF MANUFACTURING OXIDE ISOLATED SEMICONDUCTOR DEVICE UTILIZING SELECTIVE ETCHING TECHNIQUE, Katumi Ogiue, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 111

4,114,505, Re. S.N. 188,706, Filed Sep. 19, 1980, Cl. 85/1 C, COATINGS AND METHODS OF APPLICATION, William J. Loeser, et al., Owner of Record: *Industrial Metal Finishing Co., Houston, Tex.,* Attorney or Agent: Edmund F. Bard, et al., Ex. Gp.: 355

4,117,899, Re. S.N. 189,508, Filed Sep. 22, 1980, Cl. 180/6.48, HYDRAULIC SYSTEM FOR A SKID-STEER LOADER, Thomas M. Sagaser, et al., Owner of Record: *Clark Equipment Company, Buchanan, Mich.,* Attorney or Agent: Harry G. Thibault, Ex. Gp.: 316

4,127,361, Re. S.N. 190,392, Filed Sep. 24, 1980, Cl. 417/480, AIR-BAKEABLE WATER-PROOF GETTER DEVICE AND METHOD OF MANUFACTURING SAME, Stephen J. Hellier, et al., Owner of Record: *S.A.E.S. Getters S.P.A., Milan, Italy,* Attorney or Agent: David R. Murphy, Ex. Gp.: 343

4,130,816, Re. S.N. 191,797, Filed Sep. 29, 1980, Cl. 367/35, CIRCUMFERENTIAL ACOUSTICAL DETECTOR, Charles B. Vogel, et al., Owner of Record: *Shell Oil Company, Houston, Tex.,* Attorney or Agent: Harold L. Denkler, et al., Ex. Gp.: 222

4,146,706, Re. S.N. 184,018, Filed Sep. 4, 1980, Cl. 536/1, POLYSACCHARIDE AND PROCESS FOR THE PRODUCTION THEREOF, Kenichi Hisatsuka, et al., Owner of Record: *Idemitsu Kosan Company Limited, Tokyo, Japan,* Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 125

4,153,508, Re. S.N. 184,017, Filed Sep. 4, 1980, Cl. 435/31 P, PROCESS FOR THE PRODUCTION OF NOVEL POLYSACCHARIDE, Kenichi Hisatsuka, et al., Owner of Record: *Idemitsu Kosan Company Limited, Tokyo, Japan,* Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 172

4,169,156, Re. S.N. 190,181, Filed Sep. 24, 1980, Cl. 424/324, N-(2-AMINOCYCLOHEPTYL)ALKANOYLANILIDES, Jacob Szmuszkovicz, Owner of Record: *The Upjohn Company, Kalamazoo, Mich.,* Attorney or Agent: John Kekich, et al., Ex. Gp.: 125

4,181,602, Re. S.N. 191,539, Filed Sep. 29, 1980, Cl. 208/216 PP, PROCESS FOR THE HYDROTREATING OF HEAVY HYDROCARBON STREAMS, Leonard M. Quick, et al., Owner of Record: *Standard Oil Company (Indiana), Chicago, Ill.,* Attorney or Agent: William T. McClain, et al., Ex. Gp.: 116

4,183,564, Re. S.N. 194,145, Filed Oct. 6, 1980, Cl. 292/113, EXTERNALLY ACCESSIBLE ADJUSTER FOR FLUSH LATCHES, L. Richard Poe, Owner of Record: *Inventor,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 355

PATENT NOTICES

Certificates of Correction for the Week of Dec. 30, 1980

Re. 30 338	4,193,354	4,210,134	4,218,945
D. 256,400	4,193,672	4,210,442	4,219,468
D. 256.859	4,193,774	4,210,888	4,219,725
3,957,431	4,193,800	4,210,958	4,219,850
3,962.098	4,194,780	4,211,054	4,220,433
4,020,465	4,194,828	4,211,497	4,220,821
4,122,831	4,196,116	4,212,801	4,221,434
4,131,422	4,199,952	4,213,056	4,221,548
4,134,753	4,200,740	4,214,882	4,221,898
4,137,335	4,202,942	4,215,029	4,222,131
4,138,298	4,202,954	4,215,791	4,222,421
4,156,683	4,203,981	4,216,027	4,222,589
4,167,099	4,204.932	4,216,188	4,223,847
4,167,542	4,206,951	4,216,803	4,224,230
4,169,009	4,207,200	4,217,144	4,224,350
4,171,423	4,207,272	4,217,368	4,225,183
4,171,772	4,207,983	4,217,772	4,226,439
4,180,292	4,208,089	4,217,949	4,226,568
4,183,826	4,208,263	4,218,003	4,229,070
4,187,271	4,208,814	4,218,253	4,229,357
4,187,672	4,209,629	4,218,610	4,229,358
4,188,477	4,209,651	4,218,664	4,229,479

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Request for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,207,388. Copper (II) Chloride-Tetrachloraluminate Battery. Filed Nov. 29, 1978. Patented June 10, 1980. Not available NTIS.

Patent 4,207,407. Aromatic Heterocyclic Polymer Alloys and Products Produced Therefrom. Filed May 3, 1978. Patented June 10, 1980. Not available NTIS.

Patent 4,207,460. Low Power Frequency Modulated Hybrid Fiber Optic Data Acquisition System. Filed Oct. 12, 1978. Patented June 10, 1980. Not available NTIS.

Patent 4,207,560. R F Area Intruder Detection and Tracking System. Filed Aug. 23, 1978. Patented June 10, 1980. Not available NTIS.

Patent 4,207,594. Electronic Indirect Measuring System. Filed July 21, 1977. Patented June 10, 1980. Not available NTIS.

Patent 4,207,764. Precision-Fin Indexing Device for Wind Tunnel Models. Filed Mar. 5, 1979. Patented June 17, 1980. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents,
Washington, D.C. 20545

Patent application 6–025,639. Energy Recovery System. Filed Mar. 30, 1979.

Patent application 6–028,780. Communications System Using a Mirror Kept in Outer Space by Electromagnetic Radiation Pressure. Filed Apr. 10, 1979.

Patent application 6–033,076. Process for Changing Caking Coals to Noncaking Coals. Filed Apr. 25, 1979.

Patent application 6–061,167. Improved Method for Producing Small Hollow Spheres. Filed July 26, 1979.

Patent application 6–076,528. Method of Fabricating Thin-Walled Articles of Tungsten-Nickel-Iron Alloy. Filed Sept. 18, 1979.

Patent 4,159,757. Bulk Material Handling System. Filed May 4, 1977. Patented July 3, 1979. Not available NTIS.

Patent 4,161,687. Method for Locating Underground Anomalies by Diffraction of Electromagnetic Waves Passing between Spaced Boreholes. Filed Sept. 12, 1977. Patented July 17, 1979. Not available NTIS.

Patent 4,169,283. Step-Control of Electromechanical Systems. Filed Apr. 4, 1977. Patented Sept. 25, 1979. Not available NTIS.

Patent 4,171,644. Means for Ultrasonic Testing When Material Properties Vary. Filed Feb. 28, 1978. Patented Oct. 23, 1979. Not available NTIS.

Patent 4,172,398. Preset Pivotal Tool Holder. Filed Feb. 28, 1978. Patented Oct. 30, 1979. Not available NTIS.

Patent 4,174,145. High Pressure Electrical Insulated Feed Thru Connector. Filed Dec. 29, 1976. Patented Nov. 13, 1979. Not available NTIS.

Patent 4,174,510. Rf Transformer. Filed Dec. 28, 1977. Patented Nov. 13, 1979. Not available NTIS.

Patent 4,175,048. Gaseous Insulators for High Voltage Electrical Equipment. Filed Sept. 6, 1977. Patented Nov. 20, 1979. Not available NTIS.

Patent 4,183,744. Method of Foaming a Liquid Metal. Filed July 28, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,189,647. Open Cycle Ocean Thermal Energy Conversion System. Filed Aug. 17, 1978. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,189,660. Electron Beam Collector for a Microwave Power Tube. Filed Nov. 16, 1978. Patented Feb. 19, 1980. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health, Chief Patent Branch,
Westwood Bldg., Bethesda, Md. 20205

Patent 4,209,860. System and Method for Multifunctional Control of Upper Limb Prosthesis via EMG Signal Identification. Filed Feb. 13, 1978. Patented July 1, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 6–122,335. Fiber Optic System for Transmission of Video Signals by Pulse-Frequency-Modulation. Filed Feb. 19, 1980.

Patent application 6–139,077. Soil Stabilization Materials and Methods. Filed Apr. 10, 1980.

Patent application 6–140,398. Two Color Narrow Bandwidth Detector. Filed Apr. 14, 1980.

Patent application 6–143,399. Pulse Compression System. Filed Apr. 24, 1980.

Patent application 6–144,462. A Method and Apparatus for Boresighting an Aircraft. Filed Apr. 28, 1980.

Patent application 6–147,412. Thermochemical Energy Transport Process. Filed May 6, 1980.

Patent application 6–150,381. Closed Torque Test Machine. Filed May 16, 1980.

Patent application 6–153,114. Developer for Dry Silver Paper. Filed May 27, 1980.

Patent application 6–153,473. Precision Laser Pulse Radiometer. Filed May 27, 1980.

Patent application 6–155,719. Fuseless Explosive Propellant Cartridge. Filed June 2, 1980.

Patent application 6–157,723. Electromagnetic Arming Rate Regulator. Filed June 9, 1980.

Patent application 6–157,925. Micro-Power Magnetometer. Filed June 6, 1980.

Patent 4,144,540. Tunable Infrared Detector with Narrow Bandwidth. Filed Feb. 6, 1978. Patented Mar. 13, 1979. Not available NTIS.

Patent 4,174,177. False Target Warning System. Filed Aug. 14, 1978. Patented Nov. 13, 1979. Not available NTIS.

Patent 4,178,855. Explosive Actuated Arming Switch Device. Filed Mar. 20, 1978. Patented Dec. 18, 1979. Not available NTIS.

Patent 4,185,497. Adiabatic Laser Calorimeter. Filed Oct. 2, 1978. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,185,557. Stress Reducing Liner and Method of Fabrication. Filed Apr. 28, 1972. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,196,055. Method of Determining the Presence of Stray Electrical Currents in a Solution. Filed Aug. 25, 1975. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,196,775. Shock-Mounted, Liquid Cooled Cold Plate Assembly. Filed Sept. 19, 1977. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,199,809. Programmable Data Terminal Set. Filed Apr. 5, 1976. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,200,669. Laser Spraying. Filed Nov. 22, 1978. Patented Apr. 29, 1980. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters,
NASA Code GP–2, Washington, D.C. 20546

Patent application 6–116,310. Autocatalytic Coal Liquefaction Process. Filed Jan. 28, 1980.

Patent application 6–161,253. Low Temperature Cross Linking Polyimides. Filed June 20, 1980.

Patent application 6–161,254. A Silicon-Slurry/Aluminide Coating. Filed June 20, 1980.

Patent application 6–161,255. Cell and Method for Electrolysis of Water and Anode Therefor. Filed June 20, 1980.

Patent application 6–161,257. Improved Method for Driving Two-Phase Turbines with Enhanced Efficiency. Filed June 20, 1980.

Patent application 6–163,838. Preparation of Perfluorinated 1,2,4 Oxadiazoles. Filed June 27, 1980.

Patent application 6–163,839. Preparation of Perfluorinated Imidoylamidoximes. Filed June 27, 1980.

Patent 4,203,723. Vitra-Violet Process for Producing Flame Resistant Polyamides and Products Produced Thereby. Filed Dec. 6, 1976. Patented May 20, 1980. Not available NTIS.

Patent 4,204,154. Portable Device for Use in Starting Air-Starts-Units for Aircrafts and Having Catle Lead Testing Capability. Filed Mar. 9, 1978. Patented May 20, 1980. Not available NTIS.

Patent 4,204,899. Cork-Resin Ablative Insulation for Complex Surfaces and Method for Applying the Same. Filed Sept. 12, 1978. Patented May 27, 1980. Not available NTIS.

Patent 4,206,970. Chromatically Corrected Virtual Image Visual Display. Filed Oct. 23, 1978. Patented June 10, 1980. Not available NTIS.

Patents Available for Licensing or Sale

4,185,407. DISPLAY DEVICE. Jack W. Lamb, 13561 Sherman Way #208, Van Nuys, Calif. 91405. Telephone Number 213–997–7625.

4,147,352. AMUSEMENT OR EDUCATIONAL APPARATUS BASED ON THE LAWS OF PROBABILITY. Jamie P. Rosero, 269 S. Lafayette Park Place, Los Angeles, Calif. 90057.

4,184,779. STIRRING DEVICE. Charles Detmer, Route 2, Box 244, Troy, Mo. 63379.

4,195,410. DEVICE FOR MEASURING THE LENGTH OF A WEB. Willi Strohmeyer, Grimsehlstrasse, 37 D–3352 Einbeck, Federal Republic of Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,325,132. SUPPORT ARM. Carl C. Olson, 215 McDaniel, Dayton, Ohio 45405.

The following patent is offered for license or sale by Chapin, Neal & Dempsey, Third National Bank Bldg., Springfield, Mass. 01103.

4,221,532. ARTICLE TRANSFERRING APPARATUS. The following two patents are offered by Peter J. Murphy, Garland and Murphy, 214 Southland Center, Dallas, Tex. 75201.

4,121,869. HOLLOW FISHING ROD WITH ELASTIC LINE.

4,151,672. FISHING ROD.

4,032,770. PORTABLE TABLE AND LAMP FIXTURE. Gloria Astrid Millette, 1416 Inwood Circle, Bloomfield Hills, Mich. 48013.

4,160,283. MAGNETIZING AND DEMAGNETIZING TOOL. Ralph W. Adams, 314 First Ave. West, Plentywood, Mont. 59254.

4,182,255. BELOW WATERLINE DEPLOYABLE HULL STABILIZING MEMBERS. Bruce D. Reid, 124 Pine St., Toms River, N.J. 08753.

4,211,541. POLLUTION CONTROL CLOSED SYSTEM. Dr. Alberto C. Fernandez, 203 Goodwin Ave., Salem, Va. 24153.

4,224,894. DEVICE FOR INDICATING A SYMBOL REPRESENTING THE LOCATION OF A PARKING PLACE. Hugo Haldemann, Basel, Switzerland, % Herbert Cohen, WIGMAN & COHEN, Suite 200, Crystal Square 3, 1735 Jefferson Davis Hwy., Arlington, Va. 22202.

4,226,416. BASKETBALL PRACTICE ASSEMBLY. Robert F. Callanan, 2359 Chestnut Ave., Long Beach, Calif. 90806.

4,226,456. CONTAINER AND CONTAINER LID. John C. Barnett, RD 5, Box 5309, Lake Ariel, Pa. 18436.

4,231,037. RADAR CLUTTER SUPPESSOR. Maurice W. Long, Correspondence to: 4620 North Park Ave., Apt. PH3W, Chevy Chase, Md. 20015. Telephone (301) 652–6356.

4,186,669. COAL BURNING PROCESS. Cowan et al. U.S. Frederick C. Cowan, Frederick Cowan & Co., Inc., 120 Terminal Drive, Plainview, N.Y. 11803.

4,214,774. DISASSEMBLABLE BOAT CARRIER AND LAUNCHER. Ronald P. Kluge and Herman F. Spirk. Correspondence to: Ronald P. Kluge, Herman F. Spirk, 5902 Bustleton Ave., Philadelphia, Pa. 19149.

General Electric Company is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Aircraft Engine Business Group, General Electric Company, 1000 Western Ave., Lynn, Mass. 01910.

3,677,012. COMPOSITE CYCLE TURBOMACHINERY.

3,825,984. METHOD FOR FABRICATING A HOLLOW BLADE.

3,844,343. IMPINGEMENT-CONVECTIVE COOLING SYSTEM.

3,890,060. ACOUSTIC DUCT WITH ASYMMETRIC ACOUSTICAL TREATMENT.

3,937,590. ACOUSTIC DUCT WITH PERIPHERALLY SEGMENTED ACOUSTIC TREATMENT.

3,946,554. VARIABLE PITCH TURBOFAN ENGINE AND A METHOD FOR OPERATING SAME.

3,983,082. INTUMESCENT FIRE RETARDANT MATERIAL AND ARTICLE.

3,996,019. FABRICATION METHOD AND FABRICATED ARTICLE.

4,019,375. MEANS FOR INDUCING VIBRATION IN AN AIRFOIL.

4,051,289. COMPOSITE AIRFOIL CONSTRUCTION.

4,052,526. INSTUMESCENT FIRE RETARDANT MATERIAL AND ARTICLE

4,065,394. INTUMESCENT FIRE RETARDANT MATERIAL.

4,070,827. METHOD AND APPARATUS FOR LIMITING INGESTION OF DEBRIS INTO THE INLET OF A GAS TURBINE ENGINE.

4,071,183. FABRICATION METHOD AND FABRICATED ARTICLE.

4,074,104. OPTO-ELECTRONIC POSITION SENSING METHOD.

4,082,378. DEFORMABLE BEARING SEAT.

4,087,199. CERAMIC TURBINE SHROUD ASSEMBLY.

4,096,616. METHOD OF MANUFACTURING A CONCENTRIC TUBE HEAT EXCHANGER.

4,107,600. ADAPTIVE FREQUENCY TO DIGITAL CONVERTER SYSTEM.

4,115,112. COBALT-BASE ALLOY AND ARTICLE.

4,118,147. COMPOSITE REINFORCEMENT OF METALLIC AIRFOILS.

4,130,175. FLUID-IMPERVIOUS ACOUSTIC SUPPRESSION PANEL.

4,131,387. CURVED BLADE TURBOMACHINERY NOISE REDUCTION.

4,132,240. VARIABLE DOUBLE LIP QUIET INLET.

Applications for license may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,828,568. ICE MAKER.

3,959,985. AIR CONDITIONING SYSTEM FOR A MOBILE HOME INCLUDING AN INTERLOCK.

3,962,885. AIR CONDITIONING SYSTEM FOR A MOBILE HOME.

3,964,271. AIR CONDITIONING SYSTEM MOUNTING ARRANGEMENT FOR A MOBILE HOME.

3,964,286. APPARATUS FOR POSITIONING PIN FINS OF A FINNED-TUBE HEAT EXCHANGER.

3,974,667. WASHING MACHINE WITH IMPROVED ADDITIVE DISPENSING MEANS.

3,977,219. LINT FILTER FOR AUTOMATIC WASHER.

4,089,187. CONDENSER-AIR FLOW SYSTEM OF A HOUSEHOLD REFRIGERATOR.

4,210,285. DISHWASHER HAVING IMPROVED SPRAY ARM.

4,213,313. RELAY CONTROL CIRCUIT FOR WASHING APPLIANCE.

4,213,338. LIQUID LEVEL INDICATOR.

4,217,010. ADJUSTABLE VOLUME-SPLIT REFRIGERATOR.

4,219,221. COUPLING FOR REJOINING SEALED TUBING.

4,219,857. PROTECTIVE METHOD AND CIRCUITS FOR SHEATHED ELECTRICAL RESISTANCE HEATING UNITS.

4,221,129. HUMIDITY SENSOR.

4,223,194. MICROWAVE OVEN WITH MEANS FOR MODIFYING ENERGY DISTRIBUTION THEREIN.

4,223,379. ELECTRONIC APPLIANCE CONTROLLER WITH FLEXIBLE PROGRAM AND STEP DURATION CAPABILITY.

Application for license may be addressed to: Division Patent Counsel, Transportation Systems Business Division, General Electric Company, 2901 East Lake Road, Erie, Pa. 16531.

4,207,778. REINFORCED CROSS-PLY COMPOSITE FLYWHEEL AND METHOD FOR MAKING SAME.

Application for license may be addressed to Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

4,215,237. BUS CONDUCTOR SUPPORT SYSTEM.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA Corporation, Sr. Vice President, Licensing, 30 Rockefeller Plaza, New York, N.Y. 10020.

4,226,219. ENGINE TIMING CIRCUIT WITH NOISE IMMUNITY.

4,226,643. METHOD OF ENHANCING THE ELECTRONIC PROPERTIES OF AN UNDOPED AND/OR N-TYPE HYDROGENATED AMORPHOUS SILICON FILM.

4,227,123. SWITCHING AMPLIFIER FOR DRIVING A LOAD THROUGH AN ALTERNATING-CURRENT PATH WITH A CONSTANT-AMPLITUDE, VARYING DUTY CYCLE SIGNAL.

4,227,125. REGULATED DEFLECTION SYSTEM.

4,227,186. SELF-STABILIZING ANALOG TO DIGITAL CONVERTER USEFUL IN PHASE LOCKED LOOP TUNING SYSTEMS.

4,227,215. TELEVISION PICTURE POSITIONING APPARATUS.

4,227,217. MULTIPLEXING ARRANGEMENT FOR A TELEVISION SIGNAL PROCESSING SYSTEM.

4,227,848. METHOD OF SLICING A WAFER.

4,227,411. RELATIVE HUMIDITY MEASUREMENT.

4,227,699. MANUAL SCANNING MECHANISM FOR VIDEO DISC PLAYER.

4,227,769. PLANAR OPTICAL WAVEGUIDE COMPRISING THIN METAL OXIDE FILM INCORPORATING A RELIEF PHASE GRATING.

4,228,050. CONDUCTIVE MOLDING COMPOSITION.

4,228,315. SOLAR CELL GRID PATTERNS.

4,228,349. III-V DIRECT-BANDGAP SEMICONDUCTOR OPTICAL FILTER.

4,228,371. LOGIC CIRCUIT.

4,228,413. SADDLE-TOROID DEFLECTION WINDING FOR LOW LOSS AND/OR REDUCED CONDUCTOR LENGTH.

4,228,446. REDUCED BLOOMING DEVICE HAVING ENHANCED QUANTUM EFFICIENCY.

4,228,454. HIGH TEMPERATURE CADMIUM BORACITE SEMICONDUCTOR DEVICE.

4,228,463. SWITCHED AFPC LOOP FILTER WITH OFFSET VOLTAGE CANCELLATION.

4,228,782. SYSTEM FOR REGULATING THE APPLIED BLADE-TO-BOULE FORCE DURING THE SLICING OF WAFERS

4,228,805. METHOD OF MEASURING BLOOD PERFUSION.

4,228,809. TEMPERATURE CONTROLLER FOR A MICROWAVE HEATING SYSTEM.

4,228,937. CLEAVING APPARATUS.

4,229,502. LOW-RESISTIVITY POLYCRYSTALLINE SILICON FILM.

4,229,714. RF CONNECTOR ASSEMBLY WITH PROVISION FOR LOW FREQUENCY ISOLATION AND RFI REDUCTION.

4,229,722. WIRE COIL ASSEMBLY FOR AN ELECTRICAL CIRCUIT.

4,229,759. SIGNAL DETECTOR INCLUDING SAMPLE AND HOLD CIRCUIT WITH REDUCED OFFSET ERROR.

4,229,760. VIDEO GAMES COLOR SYNTHESIS.

4,229,787. FLYBACK TRANSFORMER.

4,230,294. CLOSED LOOP ROLL CONTROL FOR MOMENTUM BIASED SATELLITES.

4,230,505. METHOD OF MAKING AN IMPATT DIODE UTILIZING A COMBINATION OF EPITAXIAL DEPOSITION, ION IMPLANATION AND SUBSTRATE REMOVAL

4,230,781. METHOD FOR MAKING ETCH-RESISTANT STENCIL WITH DICHROMATE-SENSITIZED ALKALI-CASEINATE COATING

4,230,794. IMPROVING ETCH RESISTANCE OF A CASEIN-BASED PHOTORESIST.

4,230,998. TELEVISION VERTICAL RAMP GENERATOR.

4,230,999. OSCILLATOR INCORPORATING NEGATIVE IMPEDANCE NETWORK HAVING CURRENT MIRROR AMPLIFIER.

4,231,009. DEFLECTION YOKE WITH A MAGNET FOR REDUCING SENSITIVITY OF CONVERGENCE TO YOKE POSITION.

4,231,062. CHARGE-COUPLED DEVICE IMAGER SYSTEM.

4,220,338. VIDEO DISC PLAYER HAVING MODULAR CONSTRUCTION.

4,220,339. CADDY-ACTUATED DECLUTCHING MECHANISM FOR VIDEO DISC PLAYER.

4,220,340. CONSTANT DRAG CARRIAGE TRANSLATING MECHANISM FOR VIDEO DISC PLAYER.

4,220,706. ETCHANT SOLUTION CONTAINING HF–HN03–H2804–H202 FOR ETCHING AL-TI-CU OR NI CONTACT METALLURGY ON SILICON SUBSTRATES

4,220,873. TEMPERATURE COMPENSATED SWITCHING CIRCUIT.

4,220,877. TEMPERATURE COMPENSATED SWITCHING CIRCUIT.

4,220,892. PHOSPHOR SCREEN FOR MODULAR FLAT PANEL DISPLAY DEVICE.

4,220,898. RASTER DISTORTION CORRECTION CIRCUIT.

4,220,915. RESISTIVITY MEASUREMENT SYSTEM.

4,220,919. CATHODE RAY TUBE DISPLAY ERROR MEASUREMENT APPARATUS AND METHOD.

4,220,925. ENCODING ANALOG SIGNALS INTO DIGITAL SIGNALS USING A TRIANGULAR REFERENCE.

4,220,930. QUASI-LINEAR AMPLIFIER WITH FEEDBACK-CONTROLLED IDLING CURRENTS.

4,220,974. AFT CIRCUIT.

4,221,465. PATCHING TAPE FOR DIFFRACTIVE SUBTRACTIVE FILTER VIEWGRAPHS.

4,221,930. FM DEFECT COMPENSATION APPARATUS.

4,221,934. COMPANDOR FOR GROUP OF FDM SIGNALS.

4,221,979. NON-INVERTING BUFFER CIRCUITS.

4,222,008. APPARATUS FOR DIVIDING AN ARBITRARY WAVEFORM INTO EQUAL-AMPLITUDE STEPS

4,222,017. ROTATABLE POLARIZATION DUPLEXER.

4,222,071. SENSITIVITY INFORMATION RECORD.

4,222,074. HORIZONTAL SYNCHRONIZING SYSTEM.

4,222,120. TUNING POSITION DISPLAY SYSTEM.

4,222,502. METER AND DISPENSING SYSTEM FOR ABRASIVE MATERIALS.

4,223,234. REDUCTION OF SPARKLE NOISE AND MOTTLING IN CCD IMAGERS.

4,223,251. DEFLECTION CIRCUIT WITH RETRACE CONTROL.

4,223,253. FOCUSING SYSTEM FOR COLOR TV CAMERA.

4,223,280. RELAXATION OSCILLATOR INCLUDING AN SCR AND HAVING SWITCH MEANS FOR INTERRUPTING CURRENT FLOW THERETHROUGH.

4,223,281. SCR RELAXATION OSCILLATOR WITH CURRENT AMPLIFIER IN ITS GATE CIRCUIT.

4,223,283. TWO INTO THREE PORT PHASE SHIFTING POWER DIVIDER.

4,223,339. VIDEO IMAGE VERTICAL DETAIL RESTORATION AND ENHANCEMENT.

4,223,340. IMAGE DETAIL IMPROVEMENT IN A VERTICAL DETAIL ENHANCEMENT SYSTEM.

4,224,084. METHOD AND STRUCTURE FOR PASSIVATING A SEMICONDUCTOR DEVICE.

4,224,536. STABILIZATION OF MONOLITHIC INTEGRATED CIRCUIT OUTPUT LEVELS.

4,224,638. FREQUENCY MULTIPLIER FOR USE WITH CCD COMB FILTER.

4,224,679. SIGNAL CORRELATION MEANS.

4,225,141. MECHANISM FOR AIDING CARRIAGE RETURN IN VIDEO DISC PLAYER.

4,225,236. FABRY-PEROT INTERFEROMETER.

4,225,816. PRECISION CURRENT SOURCE.

4,225,874. SEMICONDUCTOR DEVICE HAVING INTEGRATED DIODE.

4,225,875. SHORT CHANNEL MOS DEVICES AND THE METHOD OF MANUFACTURING SAME.

4,225,897. OVERCURRENT PROTECTION CIRCUIT FOR POWER TRANSISTOR.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 29, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-23-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-10-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-11-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	12-12-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-5-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-8-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-0-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-21-78
DESIGNS, GROUP 290—Vacant. Industrial Arts; Household, Personal and Fine Arts.	1-8-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-18-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-20-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-1-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-1-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during November 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,109,176 to 3,112,486, inclusive
Plant Patents..... Numbers 2,295 to 2,323, inclusive

REISSUES

DECEMBER 30, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,461

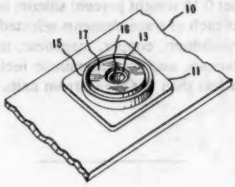
RESILIENT CENTER BEARING ASSEMBLY

William H. Bogar, deceased, late of Newark, Del. (by Jean Armstrong Bogar, executrix), and Howard D. Irwin, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,986,752, dated Oct. 19, 1976, Ser. No. 576,227, May 9, 1975. Continuation-in-part of Ser. No. 460,189, Apr. 11, 1974, abandoned. Application for reissue Aug. 2, 1977, Ser. No. 821,317

Int. Cl.[2] B61F *5/16*; F16C *17/04, 27/08*; F16F *1/44*

U.S. Cl. 308—137 **8 Claims**



1. A railway car center plate assembly comprising a truck bolster and a body bolster, the truck bolster being rotatable with respect to the body bolster and having secured to its top side a bowl-shaped truck center plate provided with a bore, said *truck* center plate having an upwardly projecting flange around its periphery and a portion of the center plate between the flange and the bore defining a flat-bearing surface; said body bolster having secured to its underside a body center plate having a flat surface from which extend downwardly two substantially perpendicular, concentric, cylindrical flanges encircling a bore, the diameter of the outermost flange being such that its outer vertical surface is encompassed by the inner vertical surface of the flange on the truck center plate, *and the outermost flange substantially vertically overlapping the flange on the truck center plate*; said bores are centrally located within the center plate and concentric with the flanges and are adapted to receive a center pin, and positioned between the body center plate and truck center plate an annular, *homogeneous, solid* synthetic elastomeric bearing pad which is located within and substantially fills the annular space between the flanges of the body center plate, *said elastomeric pad having a top, horizontal bearing surface and a bottom, horizontal bearing surface, said bottom, horizontal bearing surface being adapted, under load, to be lower than the bottom edge of the flanges on the body center plate;* and under load said pad contacts the vertical surfaces of the flanges of the body center plate, said elastomeric pad alone transmits the weight of the car from the body center plate to the truck center plate *and spreads the load over the total bearing surface.*

5. A railway car body center plate assembly which comprises:

(a) a metal base plate having a flat surface on its underside from which extend downwardly two substantially perpendicular, concentric, cylindrical flanges encircling a bore, the diameter of the outermost flange being adapted such that its outer vertical surface may be encompassed by the inner vertical surface of the flange on a truck center plate, and the outermost flange is adapted to substantially vertically overlap the flange on the truck center plate, said bore being centrally located within the center plate and concentric with the flanges and being adapted to receive a center pin, and

(b) positioned beneath the base plate, an annular, homogeneous, solid synthetic elastomeric bearing pad which is located within and substantially fills the annular space between the flanges of the body center plate, and, under load, contacts the vertical surfaces of the flanges of the body center plate, said elastomeric pad having a top, horizontal bearing surface and a bottom, horizontal bearing surface, said bottom, horizontal bearing surface being adapted under load to be lower than the bottom edge of the flanges on the body center plate, and said elastomeric pad being adapted to alone transmit the weight of the car from the body center plate to a truck center plate and spread the load over the total bearing surface.

Re. 30,462

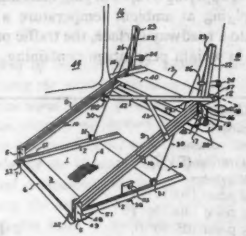
LIFT ASSEMBLY FOR VAN OR THE LIKE

Leo Pohl, #7, 4826 - 11th St., NE., Calgary, Alberta, Canada (T2E 2W7)

Original No. 3,984,014, dated Oct. 5, 1976, Ser. No. 482,550, Jun. 24, 1974. Application for reissue Sep. 28, 1978, Ser. No. 946,617

Int. Cl.[2] B60P *1/44*

U.S. Cl. 414—545 **7 Claims**



7. A lift assembly, for use in association with a vehicle having a floor surface and a doorway at which the lift assembly is located, comprising:

a platform having an upper surface and outer and inner edges, rotatable between an upstanding stored position interior of the vehicle and an intermediate position outside the vehicle and substantially level with the immediate adjacent floor surface of the vehicle, and which can be raised or lowered disposed in a plane substantially parallel to the vehicle's floor surface between the intermediate position and a ground position, said platform inner edge being closer to the vehicle, when in the intermediate position, than the outer edge;

a pair of parallelogrammatic linkages connecting the vehicle and the platform, each linkage comprising pivotally connected parallel links disposed in a common substantially vertical plane and extending along a respective side of said platform and inwardly beyond said inner edge, each of said linkages having an inner link pivotally connected at its upper end only to the vehicle adjacent said vehicle floor surface and an outer link rigidly connected to said platform at its upper surface and near said outer edge thereof;

each inner link being adapted to rotate about its pivot connection with the vehicle when the lift assembly is moving between the stored and intermediate positions, but being adapted to abut the vehicle, when the lift assembly is moving between the intermediate and ground positions, to prevent further rotation of the platform;

means for associating the platform and linkages together when rotating between the stored and intermediate positions so that they move in unison and form a compact assembly;

a pair of upstanding spaced standards attached to the vehicle

just inwardly of the doorway, one of said linkages being positioned adjacent the base of each standard;

take-up means carried by the vehicle; and

a pair of cable-like members, each having one end attached to the take-up means for being wound and unwound thereon, the other ends of said cable-like members running over a position upwardly on a respective one of said standards and downwardly to a respective side of said platform for connection therewith intermediate said inner and outer edges and nearer the inner edge thereof, said cable-like members being operative to apply lifting forces to said platform only at said side connections to raise, lower and rotate the platform between positions.

Re. 30,463

TRAFFIC PAINT METHOD AND COMPOSITION

David R. Miller, Newnan, Ga., and Jack E. Wolfe, deceased, late of Hughesville, Pa. (by Edith B. Wolfe, executrix), assignors to Prismo Universal Corporation, Rockville, Md.

Original No. 4,025,476, dated May 24, 1977, Ser. No. 619,355, Oct. 3, 1975. Application for reissue Mar. 30, 1979, Ser. No. 25,598

Int. Cl.[3] **C09D** *3/66*

U.S. Cl. 260—22 CQ **16 Claims**

1. A method of applying a rapid drying marking composition comprising applying at ambient temperature a traffic paint composition onto a roadway surface, the traffic paint composition, expressed in weight percentage containing:

resin binder	16–22
pigments(s)	47–48
pigment volume concentration (PVC)	46–59
solvent system:	
boiling point 190–141° F.	5–11
boiling point 140–106° F.	12–17
boiling point 105–90° F.	2–[28]*28.99*
boiling point greater than 225° F.	0–12
solids content	67.5–75.5

and allowing the thus applied paint composition to dry to a track-free state at ambient temperature in a period of 60 seconds or less.

Re. 30,464

AMMOXIDATION PROCESS

Howard P. Angstadt, Media, Pa.; Jack D. Tinkler, Corona del Mar, Calif.; Richard V. Norton, Dublin, Ohio, and Ronald D. Bushick, Glen Mills, Pa., assignors to Sun Ventures, Inc., Radnor, Pa.

Original No. 4,070,393, dated Jan. 24, 1978, Ser. No. 691,757, Jun. 1, 1976. Continuation-in-part of Ser. No. 559,617, Mar. 18, 1975, abandoned. Application for reissue Sep. 25, 1978, Ser. No. 945,358

Int. Cl.[2] **C07C** *120/14*

U.S. Cl. 260—465 C **9 Claims**

6. A process for the preparation of an aromatic dinitrile of the benzene and naphthalene series which comprises reacting a [lower] *dilower* alkyl-substituted hydrocarbon of the benzene or naphthalene series with ammonia and oxygen at a temperature of between about 350° and about 525° C. in the presence of a supported vanadium catalyst in a fixed bed, the mole ratio of ammonia to hydrocarbon being from about 2:1 to about 3:1, the mole ratio of oxygen to hydrocarbon being from about 2:1 to about 3:1, and distributing the oxygen through spaced apart inlets along the length of the bed.

Re. 30,465

ALUMINUM ALLOY WIRE

Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Original No. 3,512,221, dated May 19, 1970, Ser. No. 814,183, Apr. 7, 1969. Continuation-in-part of Ser. No. 779,376, Nov. 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 730,933, May 21, 1968, abandoned. Application for reissue Sep. 23, 1974, Ser. No. 508,223

Int. Cl.[3] **B21C** *1/00;* **C22F** *1/04*

U.S. Cl. 428—606 **4 Claims**

8. Aluminum alloy [rod or] wire having a minimum conductivity of sixty-one percent IACS and a diameter or greatest perpendicular distance between parallel faces of between [3.00] *0.374* inches and 0.0031 inches and containing substantially evenly distributed iron aluminate inclusions in a concentration produced by the presence of about 0.45 to about 0.95 weight percent iron in an alloy mass consisting essentially of about 98.95 to less than 99.45 weight percent aluminum; no more than about 0.15 weight percent silicon; and less than 0.05 weight percent each of trace elements selected from the group consisting of vanadium, copper, maganese, magnesium, zinc, boron, and titanium, said iron aluminate inclusions having a particle size of less than 2,000 angstrom units.

Re. 30,466

METHOD AND DEVICE FOR GENERATING A MAGNETIC FIELD OF A POTENTIAL WITH ELECTRIC CURRENT COMPONENTS DISTRIBUTED ACCORDING TO A DERIVATIVE OF THE POTENTIAL

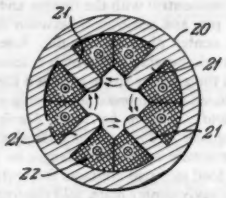
Hidetsugu Ikegami, 9-16, Tsurukawa 3-chome, Machida-shi, Tokyo, Japan

Original No. 4,153,889, dated May 8, 1979, Ser. No. 773,312, Mar. 1, 1977. Application for reissue Jun. 13, 1979, Ser. No. 48,153

Claims priority, application Japan, Mar. 19, 1976, 51-29266

Int. Cl.[3] **H01F** *5/00*

U.S. Cl. 335—213 **28 Claims**



1. A method of generating a 2N-pole magnetic field in a hollow space, N being representative of an integer, said magnetic field being derived from a static magnetic potential ϕ defined in said space, said method comprising the steps of providing a yoke member having an inside surface which defines said space and provides a plane curve when cut by a plane, providing a coil member having current paths transversely along said yoke member's inside surface of said plane, and causing electric currents to flow through the respective current paths with a distribution of components perpendicular to said plane of said electric currents given by $-d\phi/ds$ where ds represents a differential line element tangential to said plane curve, said yoke member not having a parallel inside surface along which said current paths are arranged for generation of the magnetic field for N=1.

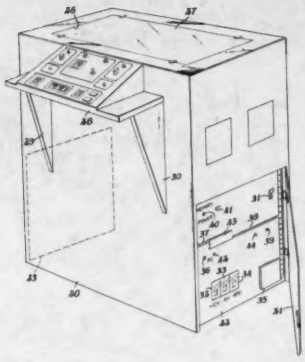
Re. 30,467
BOWLING SCORER UTILIZING SEMICONDUCTOR ELEMENTS

Robert W. House; Rolland D. King; Robert F. Roller, all of Columbus, Ohio, and David A. Williams, Largo, Fla., assignors to Brunswick Corporation, Muskegon, Mich.

Original No. 3,375,352, dated Mar. 26, 1968, Ser. No. 271,644, Apr. 9, 1963. Application for reissue Dec. 29, 1978, Ser. No. 974,624

Int. Cl.[2] A63D 5/04; G06F 15/44

U.S. Cl. 364—411 **46 Claims**



1. An apparatus for scoring a bowling game for a multiplicity of players comprising: means for receiving pinfall information for a multiplicity of players, a single computation means for computing bowling scores for said multiplicity of players connectable to said receiving means a multi-player storage means for storing scores earned by said multiplicity of players connectable to said single computation means, means for providing said single computation means with any one of the stored scores in said multi-player storage means, and a single control means connected to said single computation means for directing the computation of bowling scores for each of said multiplicity of players.

Re. 30,468
SIGNAL COMPRESSORS AND EXPANDERS

Ray M. Dolby, San Francisco, Calif., and Paul A. Spencer, Bromley, England, assignors to Dolby Laboratories, Inc., San Francisco, Calif.

Original No. 3,978,409, dated Aug. 31, 1976, Ser. No. 477,205, Jun. 7, 1974. Continuation-in-part of Ser. No. 346,689, Mar. 30, 1973, abandoned. Application for reissue Aug. 28, 1978, Ser. No. 937,625

Claims priority, application United Kingdom, Apr. 4, 1972, 15484/72

Int. Cl.[3] H04B 1/64

U.S. Cl. 455—72 **78 Claims**

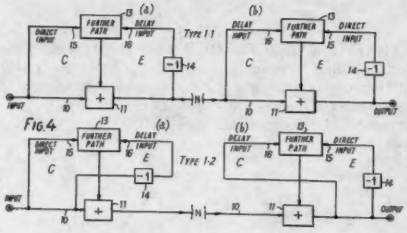


FIG. 4

77. *A method of modifying the dynamic range of an input signal, comprising the steps of providing a main signal component derived from the input signal, forming a difference signal between a second signal component derived from the input signal and a delayed version of a third signal component derived from the input signal, the delay of the delayed third signal component delaying the third signal component relative to the second signal component, combining the said difference signal with the main component to modify the main component when said difference signal exists, and restricting the said difference signal to an amplitude which is not greater than about one-tenth the amplitude of the main component.*

PATENTS

GRANTED DEC. 30, 1980

ERRATA

For CLASS	See PATENT NO.
239–251	4,241,464
434–043	4,241,519
434–102	4,241,520
434–112	4,241,521
434–405	4,241,522
052–742	4,241,543
474–082	4,241,617
440–059	4,241,686
440–063	4,241,687
440–026	4,241,688
269–289 R	4,241,772
296–037.7	4,241,870
292–165	4,241,888
312–012	4,241,955
406–109	4,242,007
423–321 R	4,242,198
106–073.3	4,242,213
556–489	4,242,272
564–159	4,242,276
568–341	4,242,278
568–303	4,242,279
568–458	4,242,281
568–471	4,242,282
568–451	4,242,283
568–454	4,242,284
570–145	4,242,286
428–423.1	4,242,488
200–153 G	4,242,577
455–611	4,242,578

PATENTS

GRANTED DEC. 30, 1980

ERRATA

Cls	See
CLASS	PATENT NO.
250-221	4,241,464
424-045	4,241,319
424-102	4,241,920
424-112	4,241,521
424-405	4,241,522
052-782	4,241,560
424-082	4,241,017
440-059	4,241,068
440-062	4,241,067
440-068	4,241,068
250-250 R	4,241,772
250-027.7	4,241,870
202-160	4,241,684
112-012	4,241,052
406-109	4,241,077
422-321 R	4,241,145
106-017.3	4,241,217
250-189	4,241,272
164-129	4,241,278
208-141	4,241,278
164-309	4,241,279
164-428	4,241,281
164-471	4,241,291
164-487	4,241,291
164-474	4,241,291
250-165	4,241,296
422-422.1	4,241,459
204-192 C	4,241,577
422-013	4,241,578

PATENTS

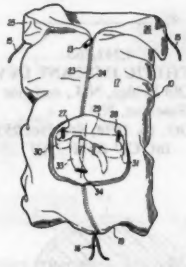
GRANTED DECEMBER 30, 1980

GENERAL AND MECHANICAL

4,241,457
ENERGY IMPACT DISSOLUTION AND TRAUMA REDUCTION DEVICE
John M. Klein, 1754 Grant, Birmingham, Mich. 48009, and Robert B. Wilson, 4912 Mansfield, Royal Oak, Mich. 48067
Filed Apr. 26, 1978, Ser. No. 900,196
Int. Cl.³ F41H *1/02*
U.S. Cl. 2—2.5 **8 Claims**

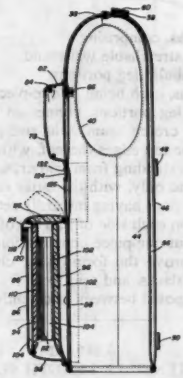
5. A protective garment, comprising:
(a) a first panel comprising a plurality of segments, each segment being in abutting relationship with adjacent segments, each abutment defining a seam,
(b) means interconnecting the segments of the panel along the seams, which means cooperate with said seams to permit the segments to limitedly rotate about the seams,
(c) a second panel overlying the first panel, the second panel comprising a plurality of segments, each one segment of the second panel being associated with one segment of the first panel such that a substantial portion of the second panel segment overlies a substantial portion of the first panel segment associated therewith to define an interface therebetween, the peripheral portion of the second panel segment overlying the panel segments adjacent the one first segments, and
(d) means for adhering the associated panel segments at the interface thereof.

4,241,458
BUNTING FOR ATTACHMENT TO A SEAT
Mary Lesesne, 1010 Sherman Ave., Bronx, N.Y. 10456
Filed Jun. 1, 1979, Ser. No. 44,718
Int. Cl.³ A41B *13/06*
U.S. Cl. 2—69.5 **11 Claims**



1. A bunting for protecting a small child against inclement weather, comprising:
blanket means for wrapping about the child;
a pair of first slots through the blanket means for passage of waist straps of a seat;
a second slot positioned between the first slots and spaced from the line including the first slots for receiving a crotch strap therethrough wherein the crotch strap cooperates with the waist straps to secure the child both within the seat and against the blanket means before the blanket means is wrapped about the child.

4,241,459
VEST FOR PHOTOGRAPHERS
Stephen R. Quayle, P.O. Box 99, Bozeman, Mont. 59715
Filed Jan. 26, 1979, Ser. No. 7,932
Int. Cl.² A41D *1/04*
U.S. Cl. 2—102 **9 Claims**

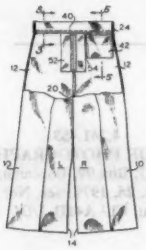


1. A garment for use by photographers to contain and protectively support photographic equipment including cameras, lenses, film and film packs, filters and meters, etc., said garment including a front opening body having a back panel defining upper, lower and opposite right and left side marginal portions and a pair of right and left side front panels defining upper, lower and adjacent inner and remote outer side marginal portions, the upper marginal portions of said front panels and the right and left hand portions of the upper marginal portions of said back panel being joined together to define right and left shoulder covering portions of said garment, the lower end portions of said remote outer side marginal portions being joined to the lower end portions of the said right and left side marginal portions of said back panel, said front panels including fabric pocket defining means secured thereto defining upwardly opening upper chest and lower waist pockets on the exterior of each of said front panels, the upper remote outer side marginal portions of said front panels and the upper portions of the corresponding side marginal portions of said back panel being spaced apart and defining upper arm openings therebetween below said shoulder covering portions, each lower pocket fabric pocket defining means defining inner, outer, bottom and opposite side walls disposed forwardly of the corresponding front panel, each lower pocket fabric defining means also defining an upstanding partition generally paralleling the corresponding side walls, extending between the corresponding inner and outer walls intermediate the side walls, permanently anchored relative to one of the corresponding inner and outer walls and releasably secured to the other of said corresponding inner and outer walls.

4,241,460
PULL-ON ACTION SLACKS

Love J. Tolbert, 1212 S. 43rd St., San Diego, Calif. 92113

Filed Jun. 8, 1979, Ser. No. 46,839
Int. Cl.³ A41D 1/06
U.S. Cl. 2—234 1 Claim

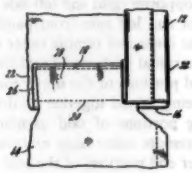


1. Pull-on slacks, comprising:
(a) an endless, stretchable waistband;
(b) a pair of tubular leg portions;
(c) rise portions, each being of one-piece construction with one of said leg portions, connected together by a back seam and a crotch seam, said rise portions being connected, at the top edges thereof, with said waist; and
(d) a front fly extending from said crotch seam to said endless waistband only, with the latter remaining intact;
(e) said rise portions having inwardly return folded reinforcing facings on each side of said fly of considerable width and of pre-cut one-piece construction with said rise portions to improve the form-fitting characteristics of the front of the slacks, and said front fly being incorporated with and disposed between said reinforcing facings.

4,241,461
EXTENSIBLE LENGTH SLEEVE

William R. Jolly, and James G. Kohn, both of Greenville, S.C., assignors to Piedmont Industries, Inc., New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 959,999
Int. Cl.³ A41D 27/10
U.S. Cl. 2—269 2 Claims

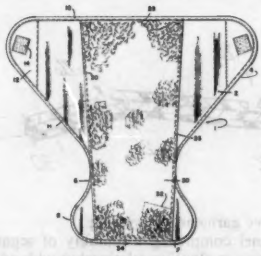


1. An extensible length sleeve comprising a sleeve having a lower section having sleeve slit edges and terminating in a pleat having a transverse pleat fold line and an underlying pleat section lying against the inside surface of said sleeve, and a cuff having an upper end and of a width less than the width of said sleeve, the upper end of said cuff connected to said underlying pleat section, the additional width of said sleeve being disposed about the sides of said cuff to provide a finished edge for said sleeve slit edges, said cuff and said underlying pleat section connected by a first line of stitching adjacent the end of said pleat and connecting said underlying pleat section and said upper end of said cuff and a second line of stitching adjacent said pleat fold line connecting said underlying pleat section and said upper end of said cuff, said first and second stitch lines being hidden from view by the portion of said sleeve overlying said underlying pleat section, said second line of stitching being selectively removable to allow said pleat to be opened to provide additional length to said extensible length sleeve.

4,241,462
DIAPER COVER TYPE GARMENT

Hiroshi Tagawa, and Kenichiro Kurisu, both of Fukuoka, Japan, assignors to Nishiki Co., Ltd., Fukika, Japan

Filed Oct. 11, 1974, Ser. No. 514,027
Int. Cl.³ A41B 9/00
U.S. Cl. 2—406 9 Claims

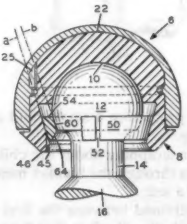


1. A garment comprising a first panel having a rearward edge and a forward edge and having lateral edges interconnecting the rearward and forward edges and further comprising a second panel having rearward and forward edges and having lateral edges interconnecting the rearward and forward edges of the second panel, the second panel being permanently attached to the first panel at rearward and forward edges with at least portions of the lateral edges of the second panel being spaced from the first panel, the second panel comprising a waterproof layer facing the first panel and a fabric layer facing away from the first panel, and means joining the first panel at positions near rearward and forward edges with an outer side of the first panel remote from the second panel whereby the first panel is formed and held as a garment with the second panel facing a body of the wearer, wherein the lateral edges of the first panel are sloped inward toward a medial portion of the first panel, thereby forming a medial narrow portion of the first panel, lateral edges of the second panel are substantially straight and the lateral edges of the second panel are positioned near medial inward portions of lateral edges of the first panel, and the second panel uniformly tapers inward from a major dimension on the rear edges to a lesser dimension on the front edges.

4,241,463
PROSTHETIC IMPLANT DEVICE

Modest Khovaylo, Old Bridge, N.J., assignor to Precision Cast Specialties, Inc., Emerson, N.J.

Filed Oct. 16, 1978, Ser. No. 951,883
Int. Cl.³ A61F 1/03
U.S. Cl. 3—1.913 15 Claims



1. An implantable prosthetic joint for use in replacement of

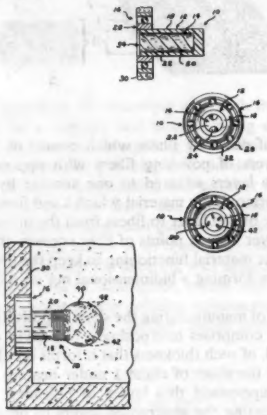
the ball end of a biological joint, said prosthetic joint having a metal spherical head for insertion into and seating in the natural socket of the joint, a bearing insert in said spherical head, said bearing insert having an outer spherical dome for engagement with the inner surface of said metal spherical head, an inner spherical dome and an outwardly extending recess at the entrance end of said inner spherical dome extending circumferentially around said entrance end and having an outwardly extending end wall and an outer wall extending downwardly from said end wall and sloping downwardly and inwardly toward said entrance, a ball shaped member seated in said inner spherical dome of said bearing insert and a ring intermediate said bearing insert and said ball shaped member, said ring having an end wall and an outer wall sloping downwardly and inwardly and in contact with said outer wall of said insert recess and an arcuate wall in contact with said ball shaped member, the length of said outer sloping wall of said ring being substantially shorter than the outer sloping wall of said recess in said bearing insert and permitting said ring to slide upwardly and expand in said recess in said bearing insert until said ball passes through said ring as said ball shaped member is inserted through the entrance end into said insert and to permit said ring to slide downwardly in said recess away from said recess end wall and wedge between said outer sloping wall of said recess and said ball shaped member when force is applied to said ball shaped member to withdraw said ball shaped member from said insert to lock said ball shaped member in said bearing insert and to permit said ring to be pushed by an unlocking tool upwardly in said recess in said bearing insert toward said outwardly extending end wall of said recess to permit said ring to be expanded outwardly sufficiently for said ball shaped member to be withdrawn through said ring and from said insert.

4,241,464

FLUID JET DEVICE

Nevin Buckwalter, 11313 N. Rome Ave., Tampa, Fla. 33612

Filed Jun. 29, 1979, Ser. No. 53,350
Int. Cl.³ E04H *3/16, 3/18*
U.S. Cl. 239—251 **3 Claims**



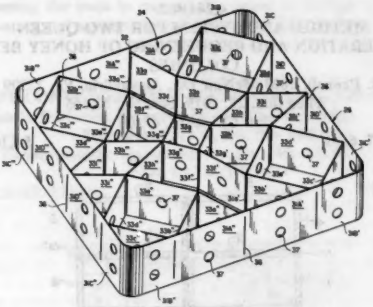
1. A fluid jet device comprising an outer housing having a centrally disposed housing channel formed therein and an elongated rotatable member operatively disposed within said housing channel in combination with a coupling means to rotatably support said elongated rotatable member, said coupling means comprises a rotating means including a first and second member, said first member being attached to a stationary element and said second member being fixedly attached to said elongated rotatable member, said rotatable member comprises an elongated substantially cylindrical member having at least one convoluted spiral formed the entire length thereof to cooperatively form a fluid channel with the periphery of said housing channel, whereby fluid forced through said convoluted spiral continuously rotates said elongated rotatable member.

4,241,465

WAVELESS WATERBED MATTRESS

Chris M. Yarimie, and Jerry E. Moore, both of Cloverdale, Calif., assignors to New World Manufacturing, Inc., Cloverdale, Calif.

Filed Jan. 3, 1979, Ser. No. 713
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—452 **5 Claims**



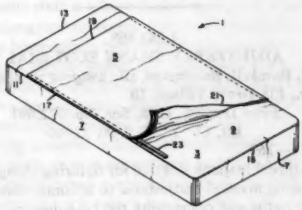
1. In a waterbed mattress: a flexible enclosure including a top wall, a bottom wall and a side wall defining a chamber for holding a body of water, and a honeycomb baffle structure having a plurality of wall sections bonded together dividing the chamber into a plurality of compartments, said honeycomb structure being affixed to the enclosure in the vicinity of the sidewall, with no connection between the honeycomb structure and the central portion of either the top wall or the bottom wall.

4,241,466

SAFETY BED SHEET

Kay S. Mendyk, 1022 Forest Rd., Schenectady, N.Y. 12303

Filed Jun. 12, 1979, Ser. No. 47,812
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—497 **1 Claim**



1. A safety bed sheet comprising a fitted bottom sheet and a superposed top sheet; said bottom sheet, when disposed in secured relationship with a mattress, defining side walls and an upper surface having length and width, longitudinal marginal edges, and foot-end and head-end marginal edges, said top sheet having a length less than the length of said bottom sheet's upper surface, said top sheet having longitudinal marginal edges, and foot-end and head-end marginal edges, the distance between the head-end marginal edge of said bottom sheet and

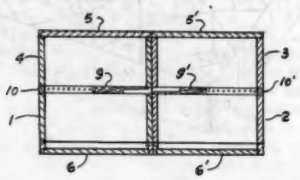
the head-end marginal edge of said top sheet being greater than the distance between the foot-end marginal edge of said bottom sheet and the foot-end marginal edge of said top sheet, said bottom sheet and top sheet being stitched together along the entire distance of one of their common, longitudinal marginal edges, said bottom sheet and top sheet being stitched together a substantial distance along the other of their common, longitudinal marginal edges and having a remaining portion of said common, longitudinal marginal edges having a separable fastening device such as of the velcro-type, said superposed top sheet having enough material allowed in its width to afford a person freedom of movement and permit such person to move freely from side to side.

4,241,467

METHOD AND SYSTEM FOR TWO-QUEEN OPERATION AND REQUEENING OF HONEY BEE COLONIES

Otis R. Pannell, 9023 McNair Dr., Alexandria, Va. 22309

Filed Jun. 29, 1979, Ser. No. 53,265
Int. Cl.³ A01K *47/00*
U.S. Cl. 6—1 **5 Claims**



4. A beeway-isolator, comprising:

a. a first rectangularly shaped member in plan view with the longer dimension equal to the outside front-to-rear dimension of a hive chamber and the shorter dimension less than the inside width of a hive chamber, said member having at least one recessed space on top and on bottom, said recessed spaces being positioned symetrically about the transverse center line of said member and extending transversely from a common side edge part way towards the opposite side edge; and

b. a second member, identical to said first rectangularly shaped member, contiguous to said first member in a horizontal plane with said recessed spaces aligned in a manner which provides bee passages between the bottom side of said first member and the top side of said second member, and between the top side of said first member and the bottom side of said second member.

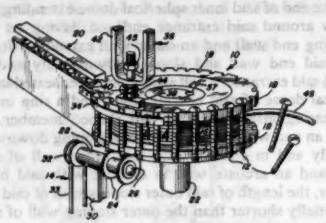
4,241,468

ADJUSTABLE SHANK SLOT DIAL

Stanley C. Burchell, Barrington, Ill., assignor to Allstar Fasteners, Inc., Elk Grove Village, Ill.

Filed Dec. 26, 1978, Ser. No. 972,697
Int. Cl.³ B23G *9/00, 11/00*
U.S. Cl. 10—169 **7 Claims**

1. An adjustable shank slot dial for fixturing elongate shanks, said dial being manually adjustable to accommodate shanks of different lengths and comprising the combination of first and second shank support members, said members having equidiameter cylindrical faces each having formed therein a plurality of circumferentially spaced axial notches sized to receive said shanks snugly across the diameters thereof, means for supporting said first shank support member for rotation about the longitudinal center axis of its cylindrical face, and means for adjustably mounting and rigidly securing said second support member onto said first support member with said circumferential faces coaxially disposed and at adjustable axial spacings with corresponding notches in the respective cylindrical faces axially aligned with one another whereby opposite end sections of the shanks are adapted to be abutted against and supported by the dial circumferential faces and the intermediate sections of the shanks are adapted to bridge the axial spacing between said circumferential faces, said mounting and securing means including complementary sets of helical



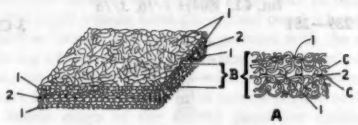
threads formed on said first and second shank support members located coaxially around the longitudinal center axis so that rotation of the second member relative to the first member effects axial movement of the second member relative to the first member to adjust the distance between said cylindrical faces to receive and support shanks of different lengths.

4,241,469

SHEET OF POLISHING FIBERS COMPRISING FIBROUS LAYERS BONDED WITH PARTICLES OF THERMOPLASTIC MATERIAL

Luis R. C. Perazzo, Entre Rios 412, 2154 Capitan Bermudez, Argentina

Continuation-in-part of Ser. No. 570,567, Apr. 23, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 950,157
Int. Cl.² A47L *13/04, 13/16;* **B32B** *7/14, 31/20*
U.S. Cl. 15—209 C **2 Claims**



1. A sheet of polishing fibers which consist of two superposed thin layers of polishing fibers with opposed interior surfaces of the layers adhered to one another by means of particles of thermoplastic material which bond fibers from the interior surface of one layer to fibers from the interior surface of the other layer only at points of fiber contact, the particles of thermoplastic material functioning to keep the fibers in their proper place by forming a bidimensional net with the bonded fibers.

2. A method of manufacturing the sheet of polishing fibers of claim 1 which comprises interposing a film layer of thermoplastic material, of such thickness that it forms the thermoplastic particles of the sheet of claim 1 under heating conditions between the superposed thin layers of polishing fibers and thereafter subjecting the superposed layers to heat and pressure.

4,241,470

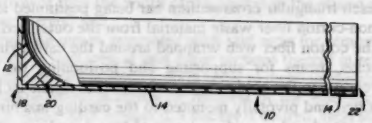
MORTAR TROUGH

John Herzig, R.R. #2, Box 1412, Paulding, Ohio 45879

Filed May 3, 1979, Ser. No. 35,549
Int. Cl.³ E04G *21/20*
U.S. Cl. 15—235.4 **7 Claims**

1. A hand construction tool for applying a bead of mortar to the upper surface of a course of bricks or blocks having a well defined and substantially constant width, in a quantity suffi-

cient and not excessive to form in combination with additional of said bricks or blocks the next higher course of bricks or blocks in building, the tool comprising an elongated semi-cylindrical wall and a panel closing and defining one end of the wall, a solid plug fittingly insertable and attachable in the end of the construction tool closed by said panel, the plug presenting a sealed flat surface to said panel and a sealed surface to



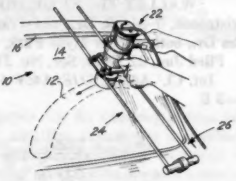
said wall and presenting a rounded surface to the interior portion of the construction tool in which said mortar is containable, the elongated wall having a diameter bearing a relationship to said constant width such that the quantity of mortar deliverable by the tool constitutes that quantity of mortar sufficient and not excessive to form said next higher course, whereby wastage of mortar and spillage of mortar on the face of said bricks or blocks is substantially eliminated.

4,241,471

POLISHING APPARATUS

Alfonso G. Elias, P.O. Box 5743, Tucson, Ariz. 85703

Filed Feb. 14, 1979, Ser. No. 12,129
Int. Cl.[3] B60S *1/02*
U.S. Cl. 15—250 R 15 Claims



1. An apparatus for removing a blemish from a windshield mounted on a vehicle, said blemish being displaced from a point on said vehicle, comprising, in combination:

polisher means for polishing said blemish;

guide means for maintaining said polisher means at a predetermined distance from said point, said polisher means being movable upon said guide means and being securable to said guide means at an operative position; and

attachment means for securing said apparatus to said point on said vehicle, said guide means and said attachment means cooperatively defining rotation means for directing movement of said polisher means over a substantially arcuate path.

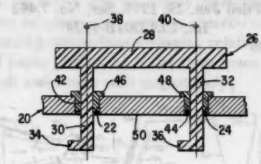
4,241,472

CARRYING HANDLE FOR A SEWING MACHINE

Ronald C. Iannarone, Hillside, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 16, 1979, Ser. No. 66,970
Int. Cl.[3] B25G *3/00*
U.S. Cl. 16—115 5 Claims

1. In combination, a handle with depending legs which terminate in eccentric pads, a sewing machine casing with top openings having the depending legs and pads extending therethrough, a split bushing about each depending leg tightly fitted in the holes in the casing and permitting the handle to be moved between a raised position for lifting the machine and a lowered out of the way position on the machine, said bushings disposing the legs laterally in said top openings in positions



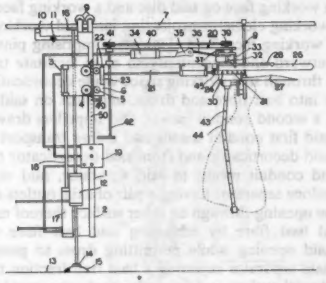
causing the pads to engage the casing in surface to surface contact and support the machine when the handle is lifted.

4,241,473

OFF CONVEYOR-LINE MEAT-HANDLING APPARATUS

Kaarlo Korhonen, Saterwag 18, Stockholm, Sweden

Filed Feb. 2, 1978, Ser. No. 874,410
Claims priority, application Sweden, Feb. 23, 1977, 7702030
Int. Cl.[3] A22B *5/00*
U.S. Cl. 17—24 24 Claims



1. Meat-cutting apparatus for use in a slaughterhouse, said apparatus being of the type for use with equipment where carcasses are transported suspended on hooks along a conveyor track using rollers, and where meat is cut at a wayside meat-cutting station from a carcass which is taken off the conveyor track which has thereon other carcasses, said apparatus comprising:

A. a stand member which can be immovably mounted at a wayside station where meat is to be cut from a carcass;

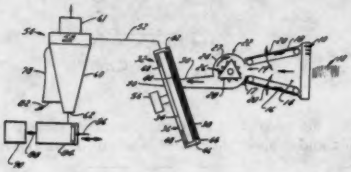
B. an elongated receiving device which cantilevers substantially horizontally from said stand member, to receive and guide a carcass suspended from a hook which is adapted to be transported along the conveyor track, said receiving device having guide means to guide a received hook into a convergent locking position, and a resiliently biased locking member which automatically locks and clamps said hook in said convergent locking position, whereby said guide means conjointly with the locking member act to retain a hook which has a suspended carcass in such a manner as to prevent dislodging of the hook from said locking position in any horizontal direction and in a vertically downward direction; and

C. pivot means to allow an arcuate movement of said receiving device about a vertical axis at the cantilevered end of the elongated receiving device, whereby the receiving device with the locked hook having the carcass suspended therefrom can be swung away from the conveyor track for cutting meat so that other carcasses on hooks can travel on the conveyor track to other wayside stations unobstructed.

4,241,474
MOBILE FLAX DECORTICATOR

Joseph A. M. Doutre, Beauharnois, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Jan. 29, 1979, Ser. No. 7,492
Int. Cl.³ D01B 1/24
U.S. Cl. 19—26 8 Claims

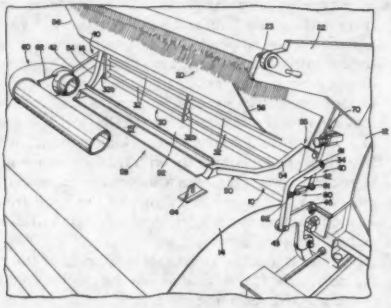


1. A mobile flax processing machine comprising, a mobile frame mounting said machine, means to collect flax straw, a shredder, means for directing collected flax to said shredder, means to rotate said shredder, a first conduit means directing flax from said shredder to a disc type flax decorticator having a rotating disc enclosed within a housing, means to rotate said disc, said flax decorticator having a working space formed between a working face on said disc and a working face in said housing, working elements projecting into said working space from said working faces said elements comprising pins sloped radially outward and tangentially so as to facilitate travel of flax straw through said working space while decorticating said flax straw into bast fibre and dross, impellers on said disc, a separator, a second conduit means, said impellers drawing air through said first conduit means and aiding transport of flax straw to said decorticator and from said decorticator through said second conduit means to said separator, said separator being a cyclone separator having a pair of axial outlets and and at least one opening through an outer surface thereof means to retain said bast fibre by inhibiting said bast fibre passing through said opening while permitting dross to pass therethrough, said separator rejecting a bast rich fraction through one of said axial outlets, and means for packaging said bast rich faction for transport.

4,241,475
WASTE REMOVER FOR CARDING MACHINE

Robert G. Miller, Charlotte, N.C., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 12, 1979, Ser. No. 11,310
Int. Cl.³ D01G 15/32
U.S. Cl. 19—98 3 Claims



1. In a cotton carding machine having a housing generally enclosing a rotatably mounted card cylinder and a rotatably mounted doffer cylinder, the cylinders having axes of rotation parallel to each other and having opposed surfaces of revolution, the cylinders being juxtaposed to define an interface area, a waste remover mechanism comprising:

an adjustably movable array of triangular cross section parallel bars immediately adjacent the surface of revolution of the rotating card cylinder, the bars each being parallel to and equidistantly spaced from the card cylinder axis of rotation, each bar extending along generally the entire length of the card cylinder, a longitudinal edge of each triangular cross section bar being positioned to strip non-cotton fiber waste material from the outer surface of the cotton fiber web wrapped around the card cylinder;

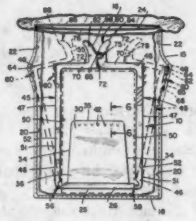
bracket means for supporting and positioning the array relative to the card cylinder, the bracket means including a first end pivotally mounted to the carding machine and a second end providing a pair of trunnions lying along a common axis of rotation parallel to the card cylinder axis of rotation, the array being rotatably mounted to and between the trunnions, the trunnions revolvable in an arcuate path about the pivot point of the pivotally mounted first end, the array being movable along the arcuate path between an engagement position with the card cylinder and an operator-accessible cleaning position spaced away from the card cylinder; and

vacuum hood means enclosing the array when in its engagement position, the vacuum hood means communicating with the interior of the main housing, the vacuum hood means operable to convey the stripped non-cotton fiber waste material from the array area to a waste station when the array is at its engagement position.

4,241,476
WALLET THEFT GUARD

Thomas Christenson, 7 Maple Dr., and Francis J. Johansson, 135 Rhodes Dr., both of New Hyde Park, N.Y. 11040

Filed Jun. 22, 1979, Ser. No. 51,106
Int. Cl.³ A45C 13/18; A45F 5/02
U.S. Cl. 24—3 R 19 Claims



1. A wallet guard for use with a wallet and adapted to be used when placed in a pocket having a lower seam and a pair of side seams defining the width thereof to prevent removal therefrom, the wallet guard comprising:

A. a base at one end of the guard having a front edge and a rear edge,

B. a support member integrally formed with said base and extending upwardly therefrom and adapted to be slipped into the wallet,

C. a pair of arms extending upwardly from said base, each said arm including a lower section integrally coupled to said base and an upper section terminating in a free end, said arms movable between an open position and a closed position, whereby in the open position the distance between said free ends is normally greater than the width of the pocket such that said arms will be biased inwardly by the side seams when inserted into the pocket with the base adjacent the lower seam to provide the upper portion of the pocket in tension,

D. said arms each having an inner surface and an outer

surface, and oppositely disposed front and rear edge intermediate said surfaces,

E. a gripping jaw formed at said free end of said upper section of each of said arms, each said gripping jaw including a gripping element having a distal end extending outwardly from said arm, such that said jaws engage the side seams of the pocket in the open position of the wallet guard to prevent removal therefrom, and said arms are narrower than the width of the pocket in the closed position thereof, and

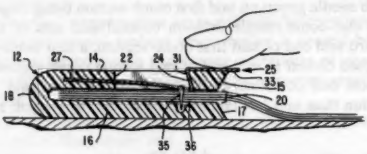
F. retaining means associated with said arms for removably securing said arms at said upper sections thereof in releasably fixed relationship to each other to maintain the closed position when insertion or removal of the wallet guard and wallet with respect to a pocket is desired, such that in the closed position of the wallet guard it may be inserted within the pocket of the user and in the open position removal thereof is prevented.

4,241,477

PAPER CLIP

John Freedom, and Thomas Freedom, both of 17100 Harlem Ave., Tinley Park, Ill. 60477

Filed Aug. 16, 1979, Ser. No. 67,200
Int. Cl.³ B42F *3/00*
U.S. Cl. 24—67 R **9 Claims**



1. An improved paper clip for retaining at least two individual pieces of paper, together, comprising in combination

a continuous U-shaped body having an upper wall and a lower wall spaced apart a distance and joined at one end by a junction portion,

said upper wall having a cut-out portion formed therein, said cut-out portion having one surface thereof having an inclined surface formed therein,

spring means mounted on said upper wall and recessed within said cut-out portion,

said spring means further including an inclined section formed integrally therewith and positioned in cooperating relation with said inclined surface of said cut-out portion such that said inclined section frictionally engages said inclined surface,

said spring means including paper piercing means formed thereon and extending downwardly therefrom in the direction of said lower wall,

said spring means constructed to have an open position when retracted with said paper piercing means raised upwardly into said cut out portion, and a closed position when said spring means with said paper piercing means depressed downwardly such that said paper piercing means extends across the open space between said upper and lower walls respectively,

said lower wall having a receiving slot formed therein and positioned in linear alignment with said paper piercing means when in the depressed and closed position,

said receiving slot being dimensionally sized to frictionally receive said paper piercing means when inserted therein,

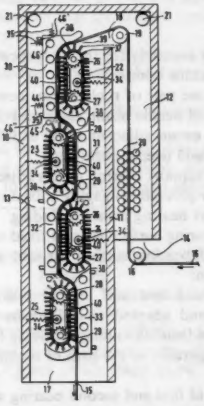
whereby said paper clip may be operated to retain two or more pieces of paper together by simply inserting said pieces of paper into the open space between said upper wall and lower wall, and depressing said spring means such that said paper piercing means extends across said open space between said upper and lower wall, through the pieces of paper positioned therein, until said paper piercing means is received in said receiving slot and frictionally engaged therein, and the paper clip being designed to be removable by simply retracting said spring means into an upper open position thereby to remove said paper piercing means from engaging relationship with the pieces of paper positioned in the open space between said upper wall and lower wall respectively.

4,241,478

APPARATUS FOR SHRINKING OF TEXTILE WEBS

Siegfried Nürk, Albstadt, Fed. Rep. of Germany, assignor to SIPRA Patententwicklungs- und Beteiligungsgesellschaft mbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,309
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803079
Int. Cl.³ D06C *29/00*
U.S. Cl. 26—18.5 **14 Claims**

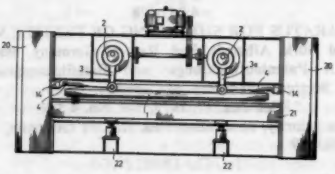


1. Apparatus for mechanically crimping and shrinking of a textile web, comprising means forming an elongated chamber through which the web to be crimped is passed in a predetermined direction; at least one pair of driven, endless grates extending spaced from each other in said direction and each being guided over a pair of rolls spaced in said direction from each other, each of said grates comprising plurality of crimping plates extending equally spaced from each other transverse to the direction of movement of said grates and each having an outer edge, each of said driven endless grates having one run moving in the direction of movement of the textile web and another run moving in the opposite direction; at least one pair of heating means in said chamber each having a smooth heated guide surface respectively extending closely spaced from the outer edges of the crimping plates on said one run of the respective crimping grate, the web to be crimped being guided onto the outer edges of said crimping plates in a reversing region of the runs of the respective grate to pass then through the space between the outer edges of said crimping plates and the heated guide surfaces adjacent thereto in crimped and longitudinally tensionless configuration; and means for driving the crimping grates of each pair respectively in opposite directions whereby the web is subjected to uniform heating and is form-stabilized without wrinkles in substantially tensionless condition.

4,241,479
NEEDLE FELT MACHINE WITH A GUIDING APPARATUS FOR THE NEEDLE BEAM

Richard Dilo, Stettinerstrasse 28, 6930 Eberbach (Neckar), Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,556
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 7717626[U]
Int. Cl.³ D04H *18/00*
U.S. Cl. 28—107 4 Claims



1. A guiding assembly for the reciprocating needle beam of a needling machine comprising:

(a) at least one pair of rocker arms positioned on opposite sides of said needle beam, each rocker arm including

(b) pivoting means adjacent a first end thereof for pivotally engaging said needle beam and

(c) pivoting support bearing means adjacent the second end thereof for pivotally engaging a fixed structure, said pivoting support bearing means including

(d) a first bearing surface on said fixed structure and

(e) a second bearing surface on said second end of said rocker arm;

(f) one of said first and second bearing surfaces being mounted and adapted to roll across the surface of the other of said surfaces along a moving load point changing generally parallel to the path of reciprocation of the needle beam;

(g) one of said first and second bearing surfaces includes an involute gear recess therein and the remaining bearing surface includes a cooperating gear tooth; and

(h) one of said first and second bearing surfaces is flat and parallel to the path of reciprocation of the needle beam and in which the remaining bearing surface is arcuate, and the moving load point changes along an arcuate path.

2. A guiding assembly for the reciprocating needle beam of a needling machine comprising at least one pair of rocker arms positioned on opposite sides of said needle beam, each rocker arm including pivoting means adjacent a first end thereof for pivotally engaging said needle beam and pivoting support bearing means adjacent the second end thereof for pivotally engaging a fixed structure, said pivoting support bearing means including

(a) a first bearing surface on said fixed structure;

(b) a second bearing surface on said second end of said rocker arm;

(c) at least one of said first and second bearing surfaces being curved;

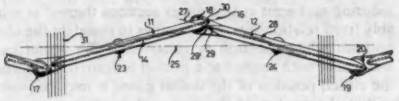
(d) one of said first and second bearing surfaces being mounted and adapted to roll across the surface of the other of said surfaces along a moving load point causing the moving load point to change generally parallel to the path of reciprocation of the needle beam;

(e) restraining means between the first and second bearing surfaces.

4,241,480
COMB SECTION PAIR OF AN EXPANSION COMB

Helmut Wiedenfeld, both of Mönchan-Gladbach, and Peter Reinardy, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,585
Int. Cl.³ D02H *13/18*
U.S. Cl. 28—213 1 Claim

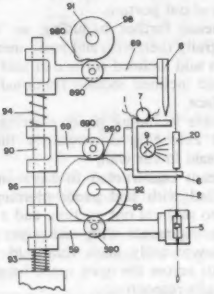


1. Comb section pair of an articulating expansion comb for processing textile threads or filamentary wires, comprising a first and second comb section pivotally joined together at an axis of rotation in the vicinity of an end of each comb section, a group of comb needles disposed on each comb section in a respective alignment plane, each of said comb needles being mutually spaced apart by a given comb needle division, said alignment planes intersecting at said axis of rotation, said axis of rotation extending exclusively through said comb needle group of said first comb section, a last comb needle of said comb needle group on said first comb section being disposed at least one comb needle division beyond said axis of rotation toward said end of said first comb section, a first comb needle disposed closest to said end of said second comb section being at most one comb needle division farther from said axis of rotation than said last comb needle of said first comb section.

4,241,481
METHOD AND APPARATUS FOR CONNECTING THE HARNESS CORDS AND THE HEDDLES OF A HARNESS

Otto Müeller, Uetikon am See, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

Filed Sep. 21, 1978, Ser. No. 944,649
Claims priority, application Switzerland, Sep. 22, 1977, 11587/77
Int. Cl.² D03J *1/00*
U.S. Cl. 28—299 12 Claims



1. In a method for connecting the upper harness cords of the harness and assemblages for a Jacquard machine to the weaving heddles, by maintaining equal tensions in the harness cords and a predescribed elevational position of the thread guides of the heddles, which connection occurs by means of a harness cord which is threaded through the upper eyelet of the heddle and is turned back on itself and the connection is secured by means of a shrink hose which is arranged above the connection, wherein the improvement comprises a plurality of harness

assemblages which are simultaneously connected to an apparatus and wherein each end of the harness cord which is threaded through the upper eyelet of the associated heddle is under equal pretension and each heddle is moved with its thread guide to a predescribed height, while the shrink hose is moved on and shrunk.

4,241,482

DEFLECTION COMPENSATING ROLL

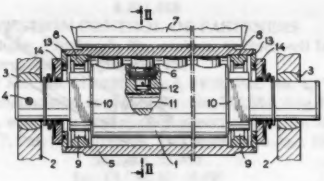
Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 23, 1978, Ser. No. 880,609

Claims priority, application Switzerland, Feb. 23, 1977, 2234/77

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **21 Claims**



1. A deflection compensating press roll which comprises:

(a) a stationary axial support beam having a central bore extending therethrough and having a plurality of generally radially extending cylinder bores in communicating relation with said central bore;

(b) a roll shell rotatably disposed about said support beam for rotation thereabout; and

(c) a plurality of hydrostatic support elements positioned in engaged relation between said beam and said shell to exert forces therebetween, at least one of said support elements including piston means which includes:

i. a generally tubular member positioned within at least one of said radially extending cylinder bores for permitting the passage of pressure fluid to support said shell;

ii. a support shoe positioned at least partially within said tubular member, said support shoe having at least one bearing surface portion adjacent the end portion of said tubular member closer to said roll shell, said bearing surface portion being fluidically connected with interior portions of said tubular member for the passage of pressure fluid thereto, and facing inner surface portions of said shell for support thereof; and

iii. means for connecting said support shoe to said generally tubular member to provide pivotal motion for said support shoe while avoiding substantial blockage of the inner opening of said generally tubular member at the end portion thereof remote from said roll shell so as to permit pressure fluid to enter said generally tubular member.

4,241,483

METHOD OF MAKING DRILL, BUSHINGS, PUMP SEALS AND SIMILAR ARTICLES

Edward J. Voitas, Mahwah, N.J., assignor to Eastern Fusecoat Incorporated, Hawthorne, N.J.

Division of Ser. No. 871,844, Jan. 24, 1978, Pat. No. 4,169,637, which is a continuation-in-part of Ser. No. 603,242, Aug. 8, 1975, Pat. No. 4,087,137. This application May 7, 1979, Ser. No. 36,504

Int. Cl.³ B21D *53/10*

U.S. Cl. 29—149.5 PM **17 Claims**

1. The method of forming a hollow bushing or similar article which comprises:

forming a blank having the desired outer and inner configurations and a central longitudinal axis;

cleaning the blank so that it is free of contaminants;

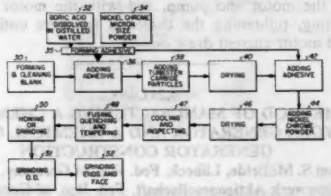
forming an adhesive of boric acid dissolved in distilled water and nickel chrome powder;

applying the wet adhesive to the inner surface of the blank;

adding tungsten carbide particles to the wet adhesive so that the wetted surface captures the tungsten carbide particles;

drying the blank at a temperature of the order of 350° to 400° F. for a time sufficient to remove the water and moisture from the blank;

adding further wet adhesive to the coated inner surface of the blank;



adding nickel chrome powder to the wet adhesive to the coated inner surface so that the wetted surface captures the nickel chrome powder;

drying the blank at a temperature of the order of 350° to 400° F. for a time sufficient to remove the water and moisture from the blank;

raising the temperature of the blank to a temperature of the order of 1925° to 2025° F.;

tempering the blank for a time and at a temperature appropriate for treating the body of the blank; and

finishing the blank to the desired size and smoothness.

4,241,484

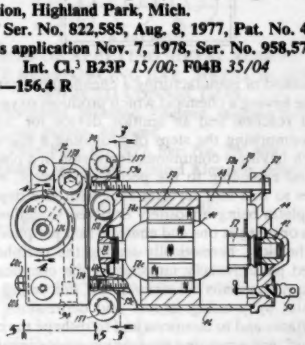
METHOD FOR ASSEMBLING A FUEL PUMP AND MOTOR

Kenneth A. Graham, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 822,585, Aug. 8, 1977, Pat. No. 4,195,971. This application Nov. 7, 1978, Ser. No. 958,572

Int. Cl.³ B23P *15/00*; F04B *35/04*

U.S. Cl. 29—156.4 R **1 Claim**



1. In the method of making a compact pump and motor assembly adapted for use as a fuel controller for an internal combustion engine fuel metering system wherein the assembly comprises a pumping chamber jointly defined by a pair of separate members and having axially spaced end walls perpendicular to a longitudinal axis of the assembly, one end wall being in one of said members and the other end wall being in the other of said members, and a peripheral wall, defined, when viewed axially, by a pair of intersecting circles, said peripheral wall being in said other member, and wherein the assembly further comprises a pair of meshed gears within said pumping chamber, one of which is disposed on an end of the motor armature shaft extending into the pumping chamber and

has a close peripheral running fit with that portion of said peripheral wall defined by one of said circles and the other of which is journaled solely on said other member for rotation with close peripheral running fit within that portion of said peripheral wall defined by the other of said circles, said two gears having close axial running fits with said two end walls, and wherein a pilot hole is provided in said other end wall concentric with that portion of said chamber peripheral wall defined by said one circle and said motor armature shaft is provided with sufficient length so that the end thereof on which said one gear is disposed extends completely through said one gear and pilots on said pilot hole, and further wherein said two members are axially secured in assembly by a plurality of threaded fasteners, the improvement which comprises operating the motor and pump, and with the motor and pump operating, tightening the threaded fasteners until predetermined motor current draw occurs.

4,241,485

METHOD OF MANUFACTURING A CHEMICAL OXYGEN GENERATOR AND A CHEMICAL OXYGEN GENERATOR CONSTRUCTION

William S. McBride, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

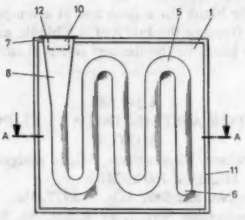
Filed Dec. 14, 1978, Ser. No. 969,455

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2756543

The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.

Int. Cl.³ B01J *7/00*; B21D *53/00, 39/03*

U.S. Cl. 29—157 R **9 Claims**



1. A method of manufacturing a chemical oxygen generator of the type having a chemical which produces oxygen through a thermal reaction and an ignition device for initiating the reaction comprising the steps of providing a plurality of flat plates each having a continuous depression in a planar surface thereof and extending to the periphery thereof, superposing said plates so that said surfaces abut with said depressions of adjacent plates being oppositely disposed to define a channel having an opening at one end abutting said periphery for housing the chemical, hermetically sealing the periphery of said superposed plates, axially introducing the chemical into said channel to substantially fill said channel, deforming said superposed plates by pressing to seal said depressions along said planar surfaces and to compress and to reshape the chemical in said channel, and arranging the ignition device in said opening.

4,241,486

METHODS OF MAKING A REVERSING VALVE CONSTRUCTION AND A VALVE MEMBER THEREFOR

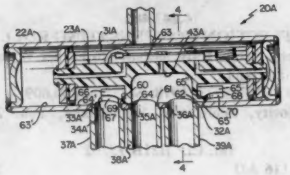
Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

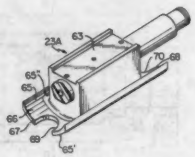
Division of Ser. No. 825,958, Aug. 19, 1977, Pat. No. 4,188,975. This application Apr. 30, 1979, Ser. No. 34,264

Int. Cl.³ B23P *15/00*

U.S. Cl. 29—157.1 R **30 Claims**

1. In a method of making a reversing valve construction having a housing means provided with a chamber carrying a movable piston-like valve member therein that controls port means of a valve seat means of said housing means through the relative position of passage means of said valve member relative to said port means, the improvement comprising the steps of forming a one-piece flexible sealing skirt to be carried by said valve member and extend outwardly therefrom in a cantilevered manner adjacent said valve seat means and providing





said flexible sealing skirt with exposed surfaces so as to be exposed to fluid pressure in said chamber that will act directly thereon and cause said flexible skirt to flex and engage said valve seat means in a manner to tend to sealingly conform to the contour of said valve seat means and thereby seal said passage means to said valve seat means while permitting sliding movement therebetween.

4,241,487

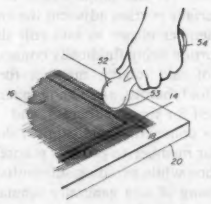
DISPOSABLE UNITARY SPLINE INSTALLATION TOOL

Richard A. Kraver, 8111 NW. 54th St., Miami, Fla. 33166

Filed Jan. 29, 1979, Ser. No. 7,504

Int. Cl.³ B25B *27/14*

U.S. Cl. 29—278 **4 Claims**



1. In the art of installing screen material in a frame which bounds an opening to be screened against insects and the like, said frame having a groove peripherally bounding the opening for receiving and retaining the peripheral part of a piece of screen material that spans the opening, and a spline which holds the peripheral part of the screen material fixed to the frame in the groove, a unitary disposable combination screen and spline installation tool intended to be supplied with a limited quantity of screen repair material for use to install said peripheral part of said piece of screen material in said groove and said spline into said groove on top of said screen material, said tool comprising a unitary body of substantially flat elongate form having at a first end a first disc-like operator member with an arc-shaped edge which is convex in cross-section for pressing said peripheral part of said screen material into said groove and thereby forming a mating groove in said screen

material, and at a second end a second disc-like operator member with an arc-shaped edge which is concave in cross section for pressing said spline into said mating groove and thereby fixing said peripheral part of said screen material into said frame for holding said screen material in place across said opening, and between said operator members a part of said body shaped as a handle, said first and second operator members being non-rotatively affixed to said handle so as to allow only frictional or limited rotational contact with said peripheral part of said screen material and with said spline, respectively, whereby during use said tool will be subjected to wear, said tool being made of a material which can be expected to wear out under frictional contact encountered in use to install said quantity of screen repair material.

4,241,488

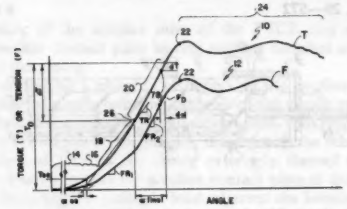
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,351

Int. Cl.³ B23P *19/06*

U.S. Cl. 29—407 **2 Claims**



1. A method for sequentially tightening a plurality of different types of joints including at least one threaded fastener, the joints having at least one empirically determined joint characteristic variable from one type of joint to the next, comprising

applying torque and imparting rotation to the fastener of the first type of joint with a tightening tool;

determining with a data processor, while tightening, a tightening parameter based on the empirically determined joint characteristic of the first type of joint for tightening the fasteners of the first type of joint to a final desired stress value;

terminating tightening of the fastener of the first type of joint in response to the tightening parameter based on the empirically determined joint characteristic of the first type of joint;

instructing the data processor to tighten succeeding joints to a final desired stress value based on the empirically determined joint characteristic of a second type of joint;

applying torque and imparting rotation to the fastener of the second type of joint with the tightening tool;

determining with the data processor, while tightening, a tightening parameter based on the empirically determined joint characteristic of the second type of joint for tightening the fasteners of the second type of joint to a final desired stress value; and

terminating tightening of the fasteners of the second type of joint in response to the tightening parameter based on the empirically determined joint characteristic of the second type of joint.

4,241,489

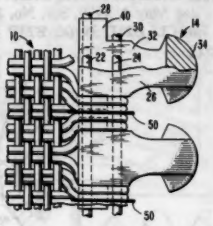
METHOD OF REMOVING FASTENING ELEMENTS FROM WOVEN TAPE

Harry F. Manning, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Filed May 21, 1979, Ser. No. 40,792

Int. Cl.³ B23P *19/04*; B26D *7/00*

U.S. Cl. 29—408 **5 Claims**



1. A method of removing fastening elements from a slide fastener tape wherein the fastening elements are secured to an inner edge portion of the tape by pluralities of loops of weft thread segments of the tape passing around longitudinal connecting and supporting means joined with and extending between the respective adjoining pairs of the fastening elements, the method comprising the steps of

cutting the connecting and supporting means along cutting lines substantially perpendicular to the tape and parallel to the weft thread segments on opposite sides of each of the fastening elements,

the cutting lines extending from said inner edge portion of the tape and terminating before reaching any warp thread which is not joined directly with the fastening elements, and

pulling the fastening elements and severed ends of the connecting and supporting means from between the weft thread segments.

4,241,490

METHOD OF APPLYING METAL SLEEVE TO CONCRETE REINFORCING BAR, METAL SLEEVE AND SWAGED CONNECTION

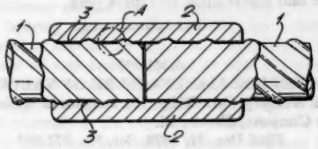
Hugh J. W. Edwards, Menston, England, assignor to CCL Systems, Limited, Surrey, England

Filed May 12, 1977, Ser. No. 796,489

Claims priority, application United Kingdom, May 14, 1976, 19956/76

Int. Cl.³ B23P *25/00*

U.S. Cl. 29—459 **2 Claims**



1. A method of applying a metal sleeve to a concrete reinforcing bar, said bar being formed of hot worked or cold worked steel, comprising providing between opposed surfaces of the sleeve and the bar, particles having a hardness greater than that of both the bar and the sleeve, and then compressing the sleeve on to the bar with sufficient force to cause the particles to bite into and grip both the bar and the sleeve, the ratio of the length of the sleeve to the diameter of the bar is in the case of a hot worked reinforcing bar about 1.6 for a 25 mm diameter bar and 2.6 for a 32 mm diameter bar, and in the case

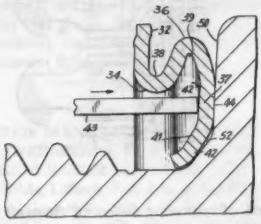
of a cold worked reinforcing bar, about 2.2 for a 16 mm diameter bar, 2.3 for a 20 mm diameter bar and 1.6 for a 25 mm diameter bar.

4,241,491

METHOD OF INSTALLING CAPTIVE TYPE SPARK PLUG GASKET WITH LOW PROFILE LOCKING TABS

Harold P. Hopp, 35 Industrial Rd., Lodi, N.J. 07644

Filed May 4, 1979, Ser. No. 36,132
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—511 **2 Claims**



1. The method of permanently installing in captive relation a compressible annular spark plug gasket upon a spark plug having a threaded shank thereon and an undercut portion which is free of threads at an inner end of said shank comprising the steps of:

(a) Providing an annular gasket having a principal axis of compression, said gasket including a sealing element including a cross-section an S-shaped sealing member with a radially inwardly extending portion adapted to abut the undercut portion of said shank, and extending radially inwardly of said S-shaped sealing member; said gasket having a plurality of elongated locking tabs extending inwardly from an inner edge of said radially extending portion at an angle thereto to position said locking tabs within a circular void formed by said S-shaped sealing member;

(b) Placing said gasket concentrically upon said threaded shank in the area of said undercut portion thereof, such that said radially extending portion abuts the body of said spark plug and said locking tabs overlie said undercut portion of said shank;

(c) Providing a tool having an operative surface of effective diameter corresponding substantially to the inner diameter of said radially inwardly extending portion; and

(d) Mechanically deforming said inwardly extending portion to place said locking tabs into said undercut area to captivate said gasket upon said spark plug.

4,241,492

PROCESS FOR MANUFACTURE OF VALVE SEAT

Arthur S. Hedberg, Park Ridge, Ill., assignor to Wells Manufacturing Company, Skokie, Ill.

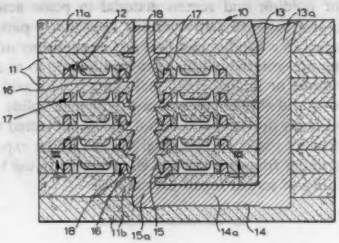
Filed Dec. 21, 1978, Ser. No. 971,697
Int. Cl.³ B22D *11/126*
U.S. Cl. 29—527.6 **12 Claims**

1. A method of manufacture of valve seats which comprises forming a series of vertically stacked molds each having at least one mold cavity with a configuration approximating that of a ring-shaped valve insert,

stacking and connecting the formed molds by a common molten metal passageway in such a way that the passageway connects with an axially facing outer surface of each mold cavity to provide a lap gating relationship,

pouring molten metal into the lap gated passageway to form a series of valve insert blanks each having a gate formed on an axially outer face,

removing blanks from the molds,



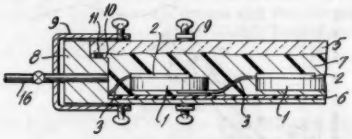
and grinding the axially outerfacing surfaces of the blanks to remove the gates.

4,241,493

METHOD OF FABRICATING SOLAR CELL MODULES

William B. Andrulitis, 8 Friend St., Manchester, Mass. 01944; Steven G. Miles, 16 Oak St., N. Billerica, Mass. 01862, and William T. Kurth, 477 Highland St., S. Hamilton, Mass. 01982

Filed Dec. 22, 1978, Ser. No. 972,246
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—572 **6 Claims**



1. A method of fabricating a solar cell module having a rigid, light transparent superstrate and a plurality of solar cells arrayed on the bottom surface of such superstrate which comprises:

preparing an array of solar cells electrically interconnected one to the other in serial and/or parallel fashion;

placing said array of solar cells in a mold, said mold having an inlet port and an outlet port and a depth substantially equal to the thickness of the module being formed;

substantially limiting the movement of said array placed in said mold;

placing and securing a rigid light transparent electrically nonconductive superstrate on top of said mold, said superstrate being spaced from the top of the array, whereby a cavity is defined between said rigid transparent member and the bottom of said mold;

pumping an encapsulant through the inlet port of said mold until all the air is expelled from the cavity defined by said superstrate and the bottom of mold; and

thereafter curing said encapsulant, thus bonding said superstrate to said array; then removing the module, including said superstrate, from the mold.

4,241,494

METHOD OF ASSEMBLING AN ELECTRICAL DEVICE

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 829,276, Aug. 31, 1977, Pat. No. 4,164,000. This application Nov. 13, 1978, Ser. No. 959,914
Int. Cl.³ H01C *17/02*
U.S. Cl. 29—619 **8 Claims**

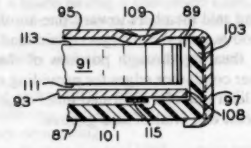
1. A method of assembling an electrical device including a

current relay having a housing with at least one female terminal therein and at least one switch means terminal extending exteriorly of the housing and with the electrical device also including a casing separate from the housing and having a sidewall formed between a pair of generally opposite end walls, recess means in the casing for receiving a PTCR and having a generally open-ended portion intersecting with one of the opposite end walls, and a passage in the casing extending through at least the sidewall thereof and communicating with the recess means, the method comprising the steps of:

(a) positioning in the recess means at least closely adjacent the other of the opposite end walls a contact plate with a terminal thereof extending through the passage exteriorly of the casing;

(b) inserting the PTCR into the recess means with one of a pair of opposite contact sides of the PTCR in electrical contacting engagement with the contact plate;

(c) arranging another contact plate on the one opposite end wall so as to at least in part close the open-ended portion of the recess means with the another contact plate being adapted for electrical contacting engagement with the



other of the contact sides of the PTCR and with the another contact plate having another terminal exteriorly of the casing;

(d) deforming a plurality of fingers on the another contact plate generally over the sidewall of the casing exteriorly thereof and engaging a plurality of distal ends respectively on the fingers of the plurality thereof with the other opposite end wall of the casing exteriorly thereof so as to releasably secure the another contact plate to the casing;

(e) disposing the casing at least adjacent the housing of the current relay with the other opposite end wall of the casing arranged generally in facing relation with the housing; and

(f) mounting one of the first named and another terminals of the first named and another contact plates in both mechanical and electrical contacting engagement directly onto the at least one switch means terminal of the current relay with the other of the first named and another terminals of the first named and another contact plates being connected in circuit relation with the at least one female terminal of the current relay.

4,241,495

METHOD AND APPARATUS FOR DISASSEMBLING WOODEN PALLETS

Dale Wakeem, Rte. 4, Box 73, Lamar, Mo. 64759

Filed Jan. 19, 1979, Ser. No. 4,753

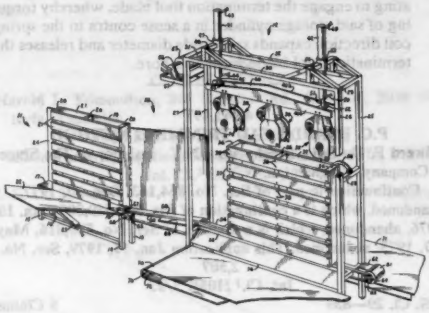
Int. Cl.³ B23P *19/00*

U.S. Cl. 29—700 **21 Claims**

1. An apparatus for disassembling wooden pallets that have a plurality of generally parallel, spaced apart ribs positioned between a plurality of outer slats that are fastened to the lateral edges of said ribs by means of nail-like fastening members, said apparatus comprising:

a working table for retaining a pallet thereon;

at least one cutting assembly having a member for forceably separating a slat from one of the lateral edges of one of the ribs to which the slat is fastened thereby to create between the slat and said edge a gap wherein a portion of each fastening member used to secure the slat to said edge is exposed, said member comprising a rigid plate having a beveled outer portion terminating in a sharp knife-like edge for engaging and shearing each fastening member used to fasten the slat to said edge thereby to detach the slat from said one edge; and



drive means for moving said cutting assembly in a direction along said rib to bring said cutting assembly into engagement with each slat fastened to said one edge.

4,241,496

BLADE STORAGE AND SELECTABLE FORCE IMPACT TERMINATION TOOL

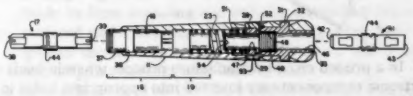
Donald L. Gregson, Paradise, Calif., assignor to Dracon Industries, Chatsworth, Calif.

Continuation of Ser. No. 825,671, Aug. 18, 1977, abandoned.

This application Mar. 23, 1979, Ser. No. 23,189

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—751 **3 Claims**



1. A hand held impact tool for use in terminating electrical conductors at a terminal block, comprising

an elongate handle,

a slide assembly mounted in said handle yieldably urged toward a position extending from one end thereof,

a hammer assembly mounted in said handle operating to deliver a hammer blow to said slide assembly,

a drive spring seat member mounted in said handle,

a hammer drive spring extending between said hammer assembly and said drive spring seat member urging said hammer assembly toward said slide assembly,

a cam follower surface on said seat member,

a cam bearing against said cam follower surface and mounted in said handle being movable relative thereto,

movement of said cam operating to alter the compressed length of said hammer drive spring, whereby said hammer blow is greater when the compressed length is lesser,

a pouch assembly in the other end of said handle,

said slide and pouch assemblies being configured to accept termination tool blades including means for engaging the electrical conductors, each of said slide and pouch being independent of the other whereby to store one termination blade in said pouch assembly while, at the same time, another termination blade is mounted in said slide assembly for use in terminating the electrical conductors,

and means in said pouch assembly for releasably retaining either of said termination blades therein,

said pouch assembly comprising a storage cylinder movable rotationally relative to said handle and having a bore therethrough accepting the termination tool blade, said

means for releasably retaining a termination blade comprising a coil spring mounted in said bore having one end thereof movable with said storage cylinder and having a diameter smaller than said storage cylinder bore and operating to engage the termination tool blade, whereby torquing of said storage cylinder in a sense contra to the spring coil direction expands said inside diameter and releases the termination tool blade from said bore.

4,241,497

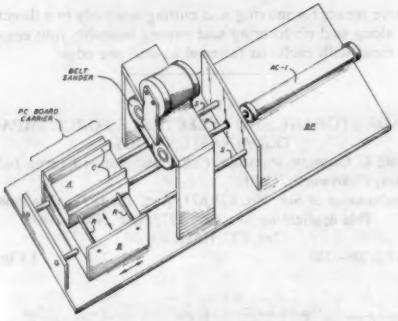
P.C. BOARD LEAD TRIMMING METHOD

Edward F. Du Bois, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation-in-part of Ser. No. 864,163, Dec. 27, 1977, abandoned, which is a continuation of Ser. No. 649,309, Jan. 15, 1976, abandoned, which is a division of Ser. No. 580,816, May 27, 1975, abandoned. This application Jan. 11, 1979, Ser. No. 2,507

Int. Cl.³ H05K *3/22*

U.S. Cl. 29—839 **5 Claims**



1. In a printed circuit manufacture process wherein leads of electronic components are inserted into appropriate holes in a printed circuit board and soldered to the foil on the underside of the board, a method of trimming the soldered component leads to a desired uniform length, comprising:

(a) cutting the component leads to a predetermined length prior to soldering, such that when fully inserted into the appropriate holes of the board the leads protrude from the foil side of the board a distance which is longer than the desired uniform length, but is shorter than a length which would result in the leads being deflected back by an oncoming driven abrasive surface;

(b) providing an abrasive means having a driveable abrasive surface;

(c) producing relative motion between the soldered printed circuit board and said abrading means to bring the leads into contact with said abrasive surface while maintaining a predetermined minimum separation between the board and said surface equal to the desired uniform length; and

(d) driving said abrasive surface to abrasively trim said leads, whereby the leads are quickly and accurately trimmed to the desired uniform length.

4,241,498

DEVICE AND METHOD FOR TERMINATING A FLAT CABLE

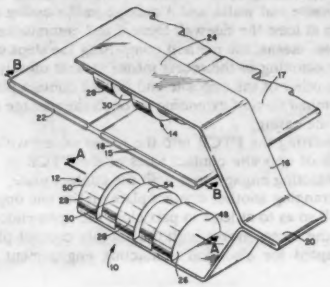
Edward P. Brandeau, Willimantic, Conn., assignor to Akzona Incorporated, Asheville, N.C.

Filed Feb. 5, 1979, Ser. No. 9,562

Int. Cl.³ H01R *43/04, 11/20*

U.S. Cl. 29—861 **17 Claims**

1. A device for terminating flat cable having at least one substantially rectangular insulated elongated conductor, said device comprising: a first member having at least one land projecting therefrom; a second member having at least one groove therein for receiving said land, said groove having a pair of side walls; said land and said groove each having at least one sharp edge; the conductor adapted to be placed between said land and said groove whereby upon the application of a



force moving said members toward one another and said land into said groove, said sharp edges of said land and said groove completely shearing through portions of the conductor and forming inner conductor edges for providing electrical contact between at least one of the formed inner edges of the conductor and at least one wall of said groove.

4,241,499

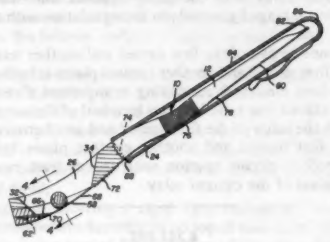
FOOT CARE INSTRUMENT

Michael A. Perrone, 4103 Hillsboro Cir., Nashville, Tenn. 37215

Filed Jun. 19, 1979, Ser. No. 49,932

Int. Cl.³ A45D *29/18*

U.S. Cl. 30—27 **11 Claims**



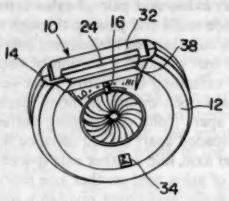
1. A multipurpose foot car instrument including an elongated handle defining front and rear ends and having top and bottom surfaces and opposite side surfaces as well as a transversely enlarged head on said front end of said handle, said head including a longitudinally convexly bowed and generally transversely straight bottom surface portion and defining a central upstanding opening extending therethrough opening upwardly through said top surface and downwardly through said bottom surface portion rearward of said front end, skin depressing and guide structure journaled in said opening between the front and rear limits of said opening, and a cutting blade supported from said head and defining a rearwardly and downwardly facing straight transverse cutting edge generally flush with said undersurface portion spaced intermediate said skin depressing and guide structure and the forward extremity of said opening and at least substantially entirely spanning the latter.

4,241,500

RAZOR WITH ADJUSTABLE BLADE POSITIONING

Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.

Filed Jul. 10, 1979, Ser. No. 56,370
Int. Cl.[3] B26B *21/24*
U.S. Cl. 30—40 21 Claims



1. In a razor accommodating a blade carrier, said blade carrier having a first substantially circular component and fixedly retaining a blade having a sharpened edge;

said razor having: a support structure for said blade carrier; a second substantially circular component engaging said first substantially circular component; and skin guard means;

said skin guard means disposed in spaced relation with said blade for defining a particular shaving geometry, the improvement comprising:

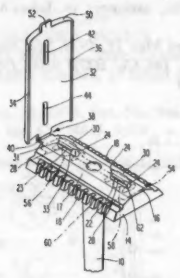
adjusting means for moving said blade carrier relative to said skin guard means thereby effecting an adjustment in said shaving geometry.

4,241,501

ONE-PIECE PLASTIC SAFETY RAZOR

Edward B. Westlake, Jr., 307 Lincoln Ave., Havertown, Pa. 19083

Filed Jan. 26, 1979, Ser. No. 6,593
Int. Cl.[3] B26B *21/32*
U.S. Cl. 30—59 6 Claims



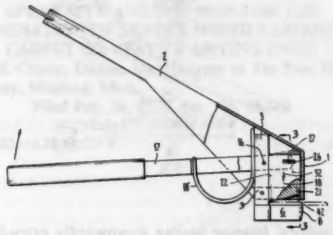
1. A plastic safety razor comprising a handle, a guard plate mounted thereon including at least one upstanding elongated locating pin adapted to extend through an opening in a razor blade, said pin including longitudinal beads extending laterally from said pin, a cover substantially coextensive with said guard plate and hinged at the rear end to said guard plate, at least one slot in said cover adapted to receive said locating pin and frictionally engage said locating pin beads when the cover is closed on the guard plate with a razor blade wedged between said cover and guard plate to lock the blade in place, and means on said locating pin to ease the lifting of said cover from the closed to the open position of the razor for replacement of the blade wherein each bead on said locating pin includes a front end wall remote from the hinged rear end of the razor, said front end walls of said beads extending substantially perpendicular to the main plane of said locating pin, said front end walls of said beads being cut off at a downwardly and rearwardly extending taper and constituting the means to ease the lifting of said cover from the closed to the open position of the razor.

4,241,502

CUTTER DEVICE

Harold L. Edmondson, 348 Bayview Rd., Rosebud, 3939 Victoria, Australia

Filed Feb. 13, 1979, Ser. No. 11,851
Claims priority, application Australia, Feb. 15, 1978, PD3380
Int. Cl.[3] B23D *27/02*
U.S. Cl. 30—241 7 Claims



1. A cutter device for cutting sheet material comprising:

a frame;

a flat blade member linearly reciprocally movable in a first direction for cutting the sheet material and in a reverse direction for retraction, said blade member having a flat cutting edge inclined to the direction of movement of said blade to form a leading end initially contacting the sheet material and a trailing end, said cutting edge having a groove therein extending from said trailing end towards and stopping short of said leading end;

a lever arm pivoted on the frame and operatively connected to the blade member for effecting the reciprocal movement thereof;

a pair of parallel, spaced blades fixed to the frame and between which the movable blade member extends for cutting cooperation therewith; and

a further blade extending transversely between the ends of said pair of blades and adjacent the trailing end of said movable blade member for cutting cooperation between the grooved portion of said cutting edge and said further blade.

4,241,503

PAIR OF SCISSORS

Makoto Sugiyama, Seki, Japan, assignor to Kaijirushi Hamono Center, Gifu, Japan

Filed Apr. 18, 1979, Ser. No. 31,169
Claims priority, application Japan, Apr. 18, 1978, 53-44790
Int. Cl.[3] B26B *13/00*
U.S. Cl. 30—268 1 Claim

1. A scissor comprising:

a first blade member having a round hole therethrough;

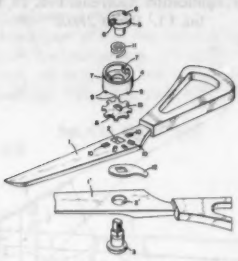
a second blade member having a square hole therethrough;

a bolt extending through said holes in said first and second blade members, said bolt including a first portion having a round cross-section which engages with said round hole in said first blade member and a second portion having a square cross-section which engages with said square hole in said second blade member whereby said first portion may rotate relative to said bolt and said second portion is unrotatable relative to said bolt, said bolt further including a third portion having a cross-section substantially equal

to a circle with at least one flat side and with threads projecting out of said second blade member;

a spring plate provided between said first and second blade members and having a square hole therethrough which said square portion of said bolt extends;

a ring shaped stopper plate having radially extending teeth and a hole having substantially the same cross-section as said third portion of said bolt therethrough provided on said bolt and engaging against a side of said second blade member, said hole engaging with said third portion of said bolt whereby said stopper plate is unrotatably relative to said bolt;



a cylindrical fastener having downwardly extending teeth and a round hole therethrough, said downwardly extending teeth engaging with spaces between said teeth of said stopper plate, said round hole further engaging with said third portion of said bolt;

a pair of opposing inwardly projecting projections provided on an inner cylindrical surface of said cylindrical fastener;

a nut having a pair of opposing notches provided in an exterior surface of said nut, said nut being screwed onto said third portion of said bolt with said notches engaging with said projections whereby said nut is unrotatable relative to said fasteners; and

a coil spring provided about said third portion of said bolt between said nut and said fastener.

4,241,504

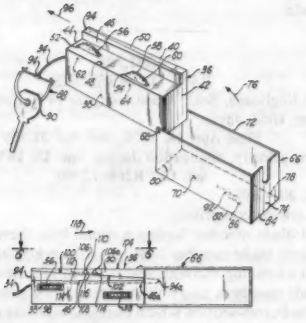
RECORD ALBUM OPENER

Jose D. Ceron, 150 W. 72nd St., New York, N.Y. 10023

Continuation-in-part of Ser. No. 833,463, Sep. 15, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 17,011

Int. Cl.³ B26B *29/00*

U.S. Cl. 30—292 **6 Claims**



1. A device for cutting the protective covering over the side walls of an object, comprising a rectangularly shaped body serving as a handle and including a pair of opposed side walls and end walls, a pair of cavities disposed between said opposed side walls, a pair of open mouth portions communicating with said pair of cavities, said pair of open mouth portions located in an upper surface of said body, said upper surface carrying an elongated protrusion thereon, said protrusion extending parallel to one of said side walls and communicating with said opposed end walls, said protrusion having a guiding surface normal to said upper surface, said guiding surface extending substantially upwardly from said upper surface, a pair of parallel spaced apart axles, said pair of axles extending normal to said opposed side walls and passing through said pair of cavities, a pair of circular cutting blades, said pair of cutting blades carried by said pair of axles, a portion of said pair of circular cutting blades extending outwardly from said upper surface and through said open mouth portions, each of said cutting blades spaced apart from said guiding surface, each of said cutting blades spaced apart a fixed distance from one another, a cover, another axle, said another axle spaced apart and parallel to said pair of axles, said another axle extending outwardly from said side walls, said cover pivotably secured to said another axle adjacent the ends thereof, said cover having a pair of opposed side surfaces disposed parallel to said opposed side walls, said cover having another surface thereof extending transverse to both said pair of surfaces, whereby said another surface covers said protrusion and said upper surface and said portion of said pair of circular cutting blades when said cover is pivoted about said another axle, said another axle being located adjacent one of said end walls and adjacent a bottom wall of said body disposed opposing said upper surface, means for selectively positioning said guiding surface at different distances from one of said each of said cutting blades while at all times maintaining the guiding surface parallel to the plane of said blades, said means for selectively positioning including a bar, said bar fixedly secured to said rectangularly shaped body, said protrusion including a rod, said rod slidably affixed to said bar, said rod carrying said guiding surface thereon, said bar and said rod having mating surfaces, said mating surfaces residing in a plane extending at an acute angle to a plane defining said guiding surface.

4,241,505

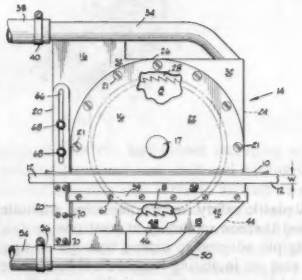
DUST SHROUD FOR PORTABLE CIRCULAR SAW

Frederick M. Bodycomb, Jr., and Glenn R. Bauman, both of Arapahoe, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed May 21, 1979, Ser. No. 40,615

Int. Cl.³ B27B *9/00, 19/04*

U.S. Cl. 30—390 **15 Claims**



1. A dust shroud for a portable circular saw, the saw having a circular blade mounted on a portable shaft, a motor to rotate the shaft, and a motor housing surrounding said motor and through one side of which said shaft projects, with said blade being mounted on said shaft at a position outside said motor housing; said shroud comprising:

(a) an upper blade housing having sides and a top enclosing an open upper interior chamber adapted to surround the greater portion of said blade while permitting free rotation

of said blade within said upper chamber, and a bottom which has a work engaging surface and an opening in said surface through which the lesser portion of said blade can project, with said upper blade housing being attached to said motor housing of said saw;

(b) a lower blade housing having sides and a bottom enclosing an open lower interior chamber adapted to surround at least a part of the lesser portion of said blade while permitting free rotation of said blade within said lower chamber, said lower blade housing having a top which has a work engaging surface and which has an opening in said surface through which said lesser portion of said blade can project, said lower blade housing being attached only to said upper blade housing and spaced therefrom by means of an external attachment link, the amount of spacing being generally equal to the width of the workpiece engaged by said saw;

(c) each of said upper and lower blade housings having incorporated therein a dust removal conduit having one end communicating with said interior chamber of said housing and the other end adapted to be removably connected to a source of vacuum and a dust collection chamber such that dust generated within said interior chamber can be removed therefrom and conveyed to said collection chamber;

(d) said attachment link joining the exteriors of said upper blade housing and said lower blade housing, with said link being aligned in the plane of said blade but spaced therefrom and disposed behind said blade with respect to said blade's direction of travel, said link having a thickness not greater than the thickness of said blade such that as the blade passes through the workpiece said link will follow said blade in the kerf created by said blade, and said link having a length sufficient to allow said housings to be spaced apart by a distance at least equal to the width of said workpiece; and

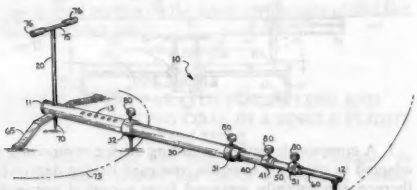
(e) flexible sealing means attached to the top portion of said lower blade housing and adapted to be in contact with said workpiece on either side of said opening in the top of said lower blade housing, such that said flexible sealing means will generally conform to the surface shape of said workpiece.

4,241,506

SKATER'S DEVICE

Edgar J. LeBlanc, 73 Pond St., rear; Lawrence Venezia, 54 Union St., and Timothy Kinchla, 19 Grant St., all of Natick, Mass. 01760

Filed Sep. 28, 1978, Ser. No. 946,807
Int. Cl.³ B43L *9/04*
U.S. Cl. 33—27 C **3 Claims**



1. A skater's device for scribing practice circles comprising:

(a) a telescoping tubular member extensible over a range of positions from a first innermost position to a second outermost position thereon;

(b) scribing means fixedly mounted at one end of said telescoping tubular member;

(c) releasable locking means connected to said telescoping tubular member to retain said telescoping member at the desired position;

(d) center pin means fixedly positioned at the outer end of said telescoping tubular member to fix the center point of a circle;

(e) toe-loop scribing means longitudinally adjustable and mounted to said telescoping tubular member;

(f) handle means secured to and extending upwardly and substantially perpendicular from said telescoping tubular member, adjacent and above said center pin means;

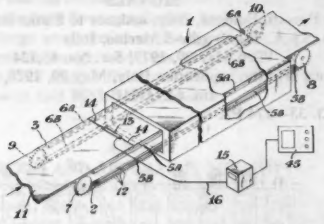
(g) support legs secured to and extending substantially downwardly and outwardly from said telescoping tubular member adjacent said center pin means.

4,241,507

APPARATUS AND METHOD FOR THE DETERMINATION OF TENTER WIDTH VARIANCE IN A CARPET OR TEXTILE DRYING OVEN

Donald H. Clarey, Dalton, Ga., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 26, 1979, Ser. No. 15,516
Int. Cl.³ G01B *5/04*
U.S. Cl. 33—125 R **2 Claims**



1. An apparatus for detecting variation in the distance between the tenter chains or cables in a carpet or textile drying oven which comprises:

(A) an electrical position sensing transducer (1) which is capable of being disposed within and transported through said carpet or textile drying oven; (2) which is equipped with a means for transmitting to the transducer differences in the distance between the tenter chains or cables as such chains or cables and said transducer traverse the length of said oven; and (3) which generates an electrical signal proportionate to the difference in the distance between said tenter chains or cables;

(B) a signal receiver to receive and display and/or record the signal from said transducer;

(C) an electrical cable for transmitting the signal from said transducer to said receiver; and

(D) means for determining the position of said transducer in said oven at the point in time when a given transducer signal is generated.

4,241,508

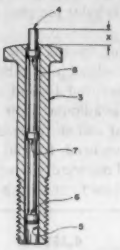
CLEARANCE INDICATOR - BLIND MEASUREMENT

Obrey Cordner, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 19, 1978, Ser. No. 970,903
Int. Cl.² G01B *3/28*
U.S. Cl. 33—169 B **3 Claims**

1. An assembly of two relatively movable parts, the first of which includes an abutment portion and the second of which includes an abutting element comprising a bolt having a head which under normal operating conditions approaches but does not contact said abutment portion, but which may under abnormal conditions may strike said abutment portion, said bolt having an axial bore extending through said head, and a pin

slidable within said bore and frictionally engaging the walls thereof, whereby the protrusion of said pin beyond said head is



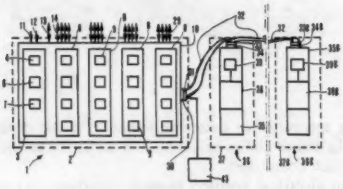
an indicator of the clearance between said bolt head and said abutment portion under normal operating conditions.

4,241,509

MODULAR ELECTRONIC APPARATUS FOR PROCESSING A PLURALITY OF MEASUREMENT SIGNALS

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs, S.p.A., Bentivoglio-S.Marino, Italy

Filed May 29, 1979, Ser. No. 43,124
Claims priority, application Italy, May 29, 1978, 3453 A/78
Int. Cl.³ G01B *7/28*
U.S. Cl. 33—174 PA **19 Claims**



1. Modular electronic apparatus for multiple simultaneous checkings carried out by processing a plurality of measurement signals, with a service module, operation modules, and electric connection means for connecting the service module and the operation modules, wherein said service module includes input circuits adapted to receive said plurality of measurement signals, power supply circuits, service circuits and amplification circuits for amplifying the measurement signals, the amplification circuits being adapted to provide amplified signals suitable for directly allowing processings by the operation modules, the electric connection means are adapted to transmit power supply signals, service signals and the amplified signals to all the operation modules, and the operation modules include programming means for allowing the reception of preselected amplified signals by means of the electric connection means.

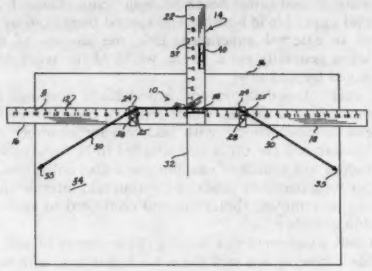
4,241,510

AID FOR HANGING PICTURES

Ronald P. Radecki, 719 E. Jefferson Blvd., South Bend, Ind. 46625

Filed Oct. 1, 1979, Ser. No. 80,453
Int. Cl.³ G01B *3/02*
U.S. Cl. 33—180 R **3 Claims**

1. A device for determining the location of two hangers for a picture or similar type wall supported member, said device comprising a base part and a perpendicular neck part, said base part being defined by oppositely located first and second arms, said base part having indicia thereon, said indicia extending from a center point outwardly along said first and second arms, said neck part having a lateral edge, said neck part having indicia along said lateral edge thereof, said neck part lateral edge being aligned with said base at said center point, a pair of slide members, one of said slide members carried by each arm and being shiftable along its supporting arm toward and away from said center point, each slide member including securing means for positioning the slide member at a predetermined location along its supporting arm, said base part indicia for determining the distance of each slide member from said center point, said slide members including guide means located in



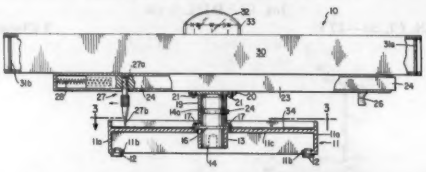
alignment with said center point for engaging the hanging wire of said wall supported member when equally spaced from said center point along said arms whereby said wire when drawn taut between said slide members will pass through said center point with said neck part extending at least to the top of said wall supported member, said neck part indicia constituting locating means for indicating the location of said wall supported member top and said guide means constituting location points for said hangers when said base and neck parts are positioned against a wall.

4,241,511

METHOD AND APPARATUS FOR DETERMINING AND RECORDING BOAT COMPASS DEVIATION

Michael J. Frigano, 66-23 Fresh Pond Rd., Ridgewood, N.Y. 11227

Filed Mar. 8, 1979, Ser. No. 18,608
Int. Cl.³ G01C *21/22, 17/10*
U.S. Cl. 33—272 **3 Claims**



1. A compass deviation recording device comprising a base adapted to receive a compass rose card having degree indicia thereon equidistantly arranged from a central perpendicular axis therethrough, a recorder gun housing mounted for rotary movement about said axis above said card and in parallel relationship to said card, said recorder gun housing including a plunger reciprocally movable therein, a stylus carried by said plunger and depending from said recorder gun housing such that the tip of said stylus rests upon the card approximately in the vicinity of said indicia, means for resiliently urging said stylus toward and into contact with said card, means connected to said plunger at the end thereof opposite to said stylus to permit rapid reciprocal movement of said plunger and said stylus, a spring within said recorder gun housing for urging said plunger in one direction to return said plunger to its initial

position after having been moved reciprocally in the opposite direction and means carried by the recorder gun housing for orienting said housing with respect to a predetermined heading.

4,241,512

DRAWING APPARATUS

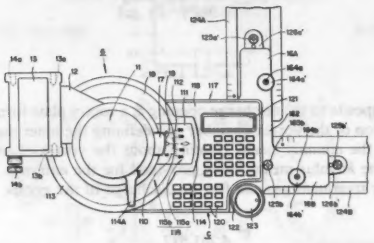
Kimijima Chikanobu; Kosakai Asao; Shioya Tutomu, and Tatsumi Tomotaka, all of Takasaki, Japan, assignors to Max Co. Ltd., Tokyo, Japan

Filed Apr. 12, 1979, Ser. No. 29,441

Claims priority, application Japan, Apr. 17, 1978, 53-49421[U]; Jan. 5, 1979, 54-818

Int. Cl.³ B43L *13/02*

U.S. Cl. 33—438 **3 Claims**



1. A drawing head of a drawing machine having a rotatable spindle for extending perpendicularly to a drawing board, a protractor and a protractor housing for receiving rotatably said protractor being disposed around said rotatable spindle, a bed plate, the lower end of said rotatable spindle being fixed to said bed plate, said bed plate comprising a fixed portion having an unchangeable azimuth angle with reference to said rotatable spindle, and a movable portion which is divided from said fixed portion by a slot and having a variable width for changing its azimuth angle with reference to said rotatable spindle, said movable portion being formed with a scale mounting portion to which straight scales are removably fixed, said drawing head comprising a casing for an electronic calculator, said casing being located between the protractor housing and the scale mounting portion on the surface of said bed plate of the drawing head and fixed to the fixed portion to cover the whole slot, said fixed portion, and a part of the movable portion and to permit the azimuth angle of the movable portion with reference to the rotatable spindle to be changed, and a bottom plate which covers a part of said movable portion, protractor, protractor housing, said fixed portion and said slot and which is fixed to said fixed portion on the lower surface side of said bed plate of the drawing head.

4,241,513

PROCESS AND APPARATUS FOR DRYING AND PREHEATING OF COKING COAL IN A SINGLE FLIGHT STREAM TUBE

Wolfgang Rohde, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

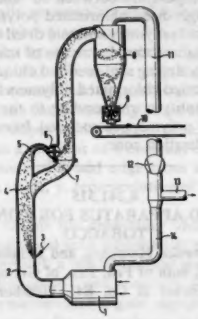
Filed Aug. 30, 1979, Ser. No. 70,993

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841088

Int. Cl.³ F27B *3/08, 17/00*

U.S. Cl. 34—10 **8 Claims**

1. In a process for drying and preheating particulate coking coal in a single flight stream tube having a lower end portion and an upper end portion, the steps of admitting a hot gas stream into said tube at said lower end portion for travel towards said upper end portion; entraining in said gas stream moist particulate coal which is admitted at said lower end portion in form of a mix of larger and smaller particle fractions; splitting said gas stream into a primary flow containing said smaller fraction and a secondary flow containing said larger fraction; decelerating the particles of said larger fraction; readmitting the decelerated particles of said larger fraction into said primary flow downstream of the location where the gas stream



was split, so that the decelerated particles of the larger fraction entering the primary flow carrying the higher-velocity smaller fraction undergo acceleration with concomitant agitation and resulting heat exchange; and separating the dried and preheated larger and smaller fractions of coal particles from said primary flow at said upper end portion.

4,241,514

PROCESS AND APPARATUS FOR DRYING CHLORINATED POLYMERS

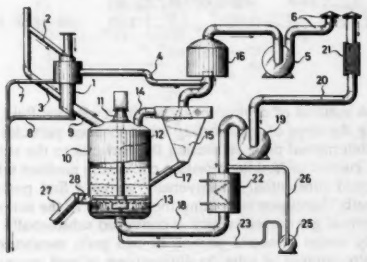
Manfred Scholz, Hürth, and Karl Kaiser, Brühl, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,455

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1978, 2800952

Int. Cl.³ F26B *7/00, 5/08*

U.S. Cl. 34—17 **5 Claims**



1. A process for drying moist chlorinated polymers separated from an acid aqueous suspension, which comprises: continuously introducing from above the moist chlorinated polymers into a vertically arranged centrifugal zone subdivided, in the direction of flow, into an upper portion , middle portion and lower portion, the middle portion having a wall permeable to liquid matter; injecting air into the upper portion of said centrifugal zone, tangentially with respect thereto, the air being injected under a pressure of 2 to 16 bars at 20° to 200° C. and causing said moist chlorinated polymers to flow through said centrifugal zone along helical lines at a velocity 10 to 150 m/s; the moist chlorinated polymers being predried while passing through said middle portion inside which they become partially deprived of liquid matter in contact with said middle

portion's permeable wall; removing the predried chlorinated polymers by injecting air having a pressure of 1.5 to 5 bars into the lower portion of said centrifugal zone and introducing them from above into a fluidization zone having a bed of fluidized chlorinated polymers therein, said bed being generated by continuously forcing a drying gas having a pressure of 1.01 to 1.30 bars and a temperature between 50° and 150° C. to pass from below through dried chlorinated polymers; mixing said predried chlorinated polymers and said dried chlorinated polymers in the fluidization zone by means of said drying gas and thereby completely drying said predried chlorinated polymers; and withdrawing dried chlorinated polymers from the fluidization zone in a quantity corresponding to the quantity of predried chlorinated polymers introduced from the centrifugal zone into the fluidization zone.

4,241,515

METHOD AND APPARATUS FOR CONDITIONING TOBACCO

Waldemar Wochnowski, Hamburg, and Reinhard Hohm, Hamburg Bahrenfeld, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

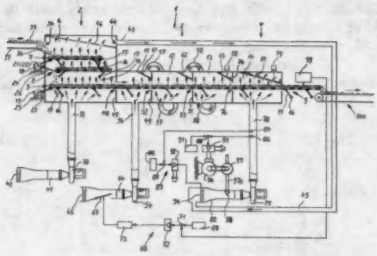
Continuation of Ser. No. 448,949, Mar. 7, 1974, Pat. No. 4,143,471, which is a continuation-in-part of Ser. No. 220,599, Jan. 25, 1972, Pat. No. 3,799,176. This application Jul. 6, 1978, Ser. No. 922,575

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1971, 2103671; Jun. 29, 1971, 2132226; Jul. 14, 1973, 2335970

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—28 **6 Claims**



1. A method of drying tobacco with a gaseous fluid, comprising the steps of transporting moist tobacco particles along a predetermined path; subjecting the particles to the action of a first current of flowing moisture containing medium which is conveyed substantially transversely across a first portion of said path; thereupon subjecting the particles to the action of a hot second gas current which is conveyed substantially transversely across a second portion of said path; monitoring the moisture content of tobacco downstream of said second portion of said path; and respectively intensifying and reducing the heating action of said second gas current when the monitored moisture content is respectively higher than and below a predetermined value.

4,241,516

APPARATUS AND PROCESS FOR TREATING PULVERIZED GRANULAR MATERIAL WITH A FLUID STREAM

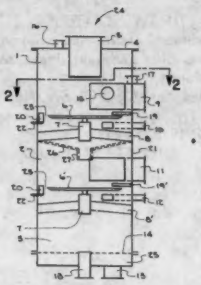
Hans Koller, Brunnmattstr. 12, CH 6048 Horw, Switzerland

Filed Apr. 11, 1979, Ser. No. 29,254

Int. Cl.³ F26B *17/00*; F27B *15/00*

U.S. Cl. 34—57 E **9 Claims**

1. The apparatus for the treatment of dusty, pulverized, granular goods with a gas consisting of a vortex chamber **1** with a tangential entrance opening for the gas and goods and a discharge opening **5** for the gas, said apparatus comprising a vortex chamber casing **(4, 6, 21)** with an annulus means **23** concentric to the axis of the chamber casing **21** at its periphery



and opposite to the discharge opening **5**, a rotary plate forming a portion of the vortex chamber and defining the inner diameter of the annulus means rotating about the vortex chamber axis, the annulus means being provided for the entrance of a further treatment gas and for the discharge of the goods.

4,241,517

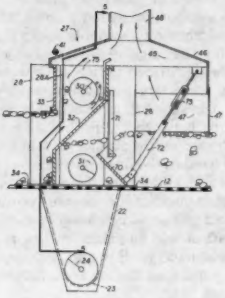
ANTI-POLLUTION ROTARY-SWEEP GRAIN DRIER

Rodney W. Carpenter, Louisville, Ky., assignor to Clayton & Lambert Manufacturing Company, Buckner, Ky.

Filed Apr. 6, 1978, Ser. No. 894,181

Int. Cl.³ F26B *19/00*

U.S. Cl. 34—79 **5 Claims**



1. An anti-pollution grain drying apparatus comprising:

A. a grain drying bin having a perforated floor through which hot air is blown upwardly for drying purposes;

B. a rotary sweep mounted in the bin for sweep movement over the floor, said sweep having

1. distributing means on its lag side for distributing wet grain over the floor,
2. radially-extending retrieving means on its lead side for removing dried grain from the floor, and
3. a partition separating the lead and lag sides of the sweep;

C. means for feeding wet grain to said distributing means;

D. means for receiving dried grain from said retrieving means and conveying said grain outside of the bin; and

E. an anti-pollution suction system for removing and capturing airborne dust coming from the grain within the confines of said sweep, said system including

1. canopy means extending over said lag side of the sweep substantially above the level of the grain on said floor,

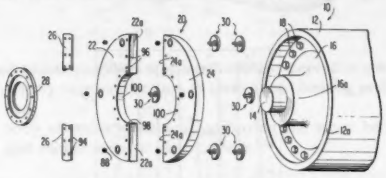
2. wall means extending downwardly from said canopy means and cooperating therewith and with said partition to form suction chamber means for receiving dust-polluted air from wet grain in the vicinity of the lag side of said partition, and
3. anti-pollution means for suctioning dust-polluted air from said suction chamber means and conducting it out of said bin to outside dust separating means.

4,241,518

THERMAL INSULATION END PANEL ASSEMBLY FOR A PAPER MACHINE DRYER CYLINDER AND STUD CLAMP THEREFOR

Fred H. Alexy, Glens Falls, N.Y., assignor to AMG Industries, Inc., Glen Falls, N.Y.

Filed Oct. 2, 1979, Ser. No. 81,239
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—110 **6 Claims**



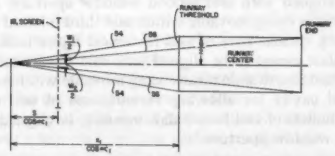
1. In combination, a thermal insulation material end panel assembly for mounting on an axial end face of a heatable dryer cylinder, said dryer cylinder being capable of drying a web passing over the peripheral surface thereof, said dryer cylinder bearing a plurality of bolts having bolt heads projecting axially from an end face thereof at spaced circumferential positions, and a plurality of stud clamps fixed to the side of said thermal insulation material end panel at circumferential positions corresponding to said bolt heads and projecting therefrom, and said stud clamps being mechanically clamped to the ends of said bolt heads for removably locking said panel to the end of said dryer cylinder.

4,241,519

FLIGHT SIMULATOR WITH SPACED VISUALS

Richard D. Gilson; Marlin O. Thurston, both of Columbus; Karl W. Olson, Worthington, and Ronald W. Ventola, Columbus, all of Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Jan. 25, 1979, Ser. No. 6,333
Int. Cl.² G09B *9/08*; H04N *7/18*
U.S. Cl. 434—43 **41 Claims**



1. Visual display apparatus for use with a flight simulator system of a variety including a base supported aircraft trainer having a cockpit and front window-like opening for providing lines of sight from an eye location within said cockpit and having flight controls manipulative to cause said cockpit to move upon said base in roll, pitch and yaw attitudes about respective longitudinal, transverse and vertical axes, said system including a stationary display surface viewable from said eye location along said lines of sight, said surface being spaced from said eye location a predetermined distance, S, for displaying the video image of a fixed horizontal horizon below which extends the image of a runway of designated length, L, between the threshold and end thereof and half-width, w/2, defined between each lengthwise edge thereof, and a reference line, said system including means for generating altitude signals, y, substantially representative of the simulated height of said eye location above said imaged runway and means for generating velocity signals representative of the instantaneous simulated velocity and said trainer with respect to ground at the level of said runway, said apparatus comprising;

first circuit means for developing slope signals corresponding with the slopes of the images of said runway lengthwise edges as a quotient of a constant of value representing the distance of a said edge from said reference line divided by a value, y, representative of said instantaneous altitude;

timing circuit means for generating video raster controls including horizontal scan information and control signals developed through a predetermined digital sequence and vertical information and control signals developed through a predetermined digital sequence;

second circuit means for generating signals representing the predetermined vertical location of a vanishing point upon said raster;

line generator circuit means responsive to said second circuit means signal, said timing circuit means horizontal scan information signals and said first circuit means slope signals for generating output signals representing the locations of said runway image lengthwise edges;

third circuit means for developing signals representing imaging data at said runway threshold and end; and

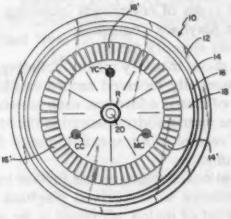
video processing means responsive to said line generator circuit means output signals, said third circuit means signals and said timing circuit means horizontal and vertical control signals for deriving video outputs.

4,241,520

COLOR CALCULATOR

Thomas K. Norton, c/o Tom Norton Designs, P.O. Box 29, Cambridge, Mass. 02139

Filed Mar. 5, 1979, Ser. No. 17,403
Int. Cl.³ B44D *2/00*
U.S. Cl. 434—102 **12 Claims**



1. Color calculator comprising

means defining at least three endless continuous loops of transparent material relatively movable through 360° cycles in overlapping fashion,

each such loop comprising in a minor area thereof, an array of color gradations in a primary color of the system as follows:

0 to 100% over 60°, then 100% over 120°, then 100% to 0 over 60°, balance blank, the 0 to 100% and 100% to 0 gradations being at substantially linear rate—i.e., equal (or other defined linear relation) increase (or decrease) in intensity per circumferential distance increment,

means for indicating the center of each such primary color array on its respective loop,

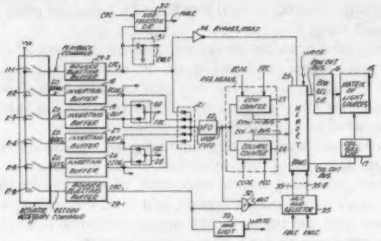
whereby (a) aligning the three centers 120° apart and in correct order produces secondary colors between the primaries, made of overlapping colors of the primary graded colors and incremental combinations therebetween, (b) overlapping the three centers produces a 240° arc of the combination of the three primaries (black in subtractive color primary system) of 100% intensity over a 120° central portion and 60° 0–100% to 0 at sides of the arc and 120° blank, and (c) other overlap combinations produce thousands of mixed colors which in all such arrangements show perfect complements, and perfect analogous step gradations around the loops, all the gradations of synthesized colors having natural gradation relationship.

4,241,521

MULTI-SYMBOL MESSAGE COMMUNICATOR FOR A SPEECHLESS, HANDICAPPED PERSON

Armand F. Dufresne, 901 Iva Ct., Cambria, Calif. 93428

Filed Sep. 13, 1976, Ser. No. 722,676
Int. Cl.³ G09B *21/00*
U.S. Cl. 434—112 **7 Claims**



1. In a matrix communicator for a speechless, handicapped person, the matrix communicator having display means which defines a symbol repertory and which responds to a matrix address by indicating a symbol selected from the symbol repertory, and having register means which stores the matrix address and which responds to command-defining signals to update the matrix address as the handicapped person composes a multi-symbol message, an improvement comprising:

means for receiving command-defining signals for defining a plurality of types of commands including a record command and a playback command;

first-in, first-out memory means;

the first-in, first-out memory means including means responsive to sequentially received record commands for compiling a list of matrix addresses, each matrix address in the list being the matrix address stored in the register means at the time of receipt of a respective one of the sequence of record commands;

the first-in, first-out memory means further including timing means responsive to a received playback command for causing the list of matrix addresses to be provided to the display means one-by-one in the same order in which they were compiled so that each of a plurality of symbols forming a message are thereby indicated.

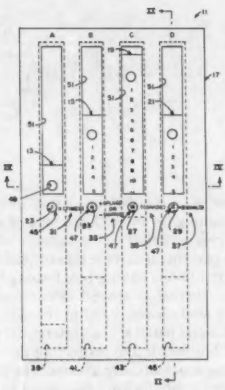
4,241,522

TEACHING AID

Raymond C. Jablonski, 1879 Coventry Dr., Memphis, Tenn. 38127

Filed Apr. 6, 1979, Ser. No. 27,778
Int. Cl.³ G09B *1/28*
U.S. Cl. 434—405 **2 Claims**

1. A teaching aid for developing learner participation in mental computation of number combinations using a standard formula involving a combination of the functions of basic arithmetic, said teaching aid comprising: an elongated first slide means, an elongated second slide means, an elongated third slide means, an elongated fourth slide means, and a frame means; said frame means having an elongated first internal cavity for slidably receiving said first slide means, having an elongated second internal cavity for slidably receiving said second slide means, having an elongated third internal cavity for receiving said third slide means, and having an elongated fourth internal cavity for receiving said fourth slide means; each of said slide means including a plurality of numerical figure indicia; said frame means having a first window aperture for allowing one of said numerical figure indicia of said first slide means to be viewed therethrough, having a second window aperture for allowing one of said numerical figure indicia of said second slide means to be viewed therethrough, having a third window aperture for allowing one of said numerical figure indicia of said third slide means to be viewed therethrough, and having a fourth window aperture for allowing one of said numerical figure indicia of said fourth slide means to be viewed therethrough; said frame means include first arithmetic function indicia located between said first and second window apertures, including second arithmetic function indicia located between said second and third window apertures, and including third arithmetic function indicia located between said third and fourth window apertures; said first, second and third arithmetic function indicia coacting to create a standard formula involving a combination of the functions of basic arithmetic, said first slide means being movable within said first internal cavity for allowing various ones of said numerical figure indicia of said first slide means to be aligned with said first window aperture, said second slide means being movable within said first internal cavity for allowing various ones of said numerical figure indicia of said second slide means to be aligned with said second window aperture; said third slide means being movable within said third internal cavity for allowing various ones of said numerical figure indicia of said third slide means to be aligned with said third window apertures; said fourth slide means being movable within said fourth internal cavity for allowing various ones of said numerical figure indicia of said fourth slide means to be aligned with said fourth window aperture.



4,241,523

SHOE SOLE STRUCTURE

Alexander C. Daswick, South Pasadena, Calif.

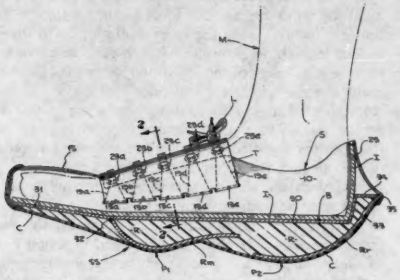
Filed Sep. 25, 1978, Ser. No. 945,443
Int. Cl.³ A43B *13/12, 5/00*
U.S. Cl. 36—30 R **1 Claim**

1. In the supporting structure of a shoe, the combination comprising:

a relatively flat rigid sheet-like member normally horizon-

tally disposed to provide a supporting base for the wearer's foot;

a relatively rigid rocker member of a generally sheet-like configuration disposed beneath said base in a rear-parallel relationship thereto, one end of said rocker member being pivotally secured to said base and the other end being spaced below said base;



said rocker member being longitudinally curved in a downwardly convex direction to form a load-bearing pedestal; and

a body of resilient material occupying the space between said rocker member and said base.

4,241,524

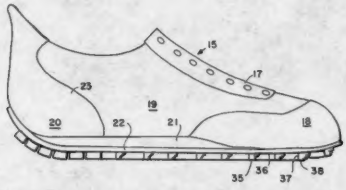
ATHLETIC SHOE WITH FLEXIBLE SOLE

Jeffrey A. Sink, 123 Belmont Ave., Redwood City, Calif. 94061

Filed May 7, 1979, Ser. No. 36,872

Int. Cl.[3] A43B *1/10, 13/04, 23/28, 5/00*

U.S. Cl. 36—102 **5 Claims**



1. An athletic shoe for the foot wherein the foot has normal bend lines extending thereacross at an angle of approximately 15° to a line normal to the longitudinal axis of the foot, said shoe comprising, in combination:

a shoe upper portion having heel, shank and toe areas in that order for enclosing the wearer's foot;

a sole attached to said shoe upper portion for supporting the wearer's foot on a running surface, comprising:

a cushioning pad of pliable material and having upper and bottom surfaces with the upper surface fixed to the shoe upper portion and having a longitudinal axis and longitudinal edges extending along the length of the shoe upper portion; and

a plurality of bar treads fixed to the bottom surface of the cushioning pad adjacent the toe and shank areas and positioned to extend substantially from one longitudinal edge thereof to the other and in a direction parallel to the normal bend lines of the foot.

4,241,525

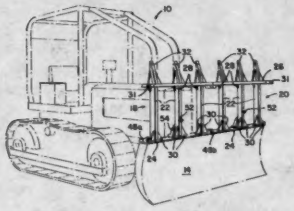
SWING-AWAY BULLDOZER TEETH ASSEMBLY

Donald B. Mann, 8811 131st Ave., NE., Lake Stevens, Wash. 98258

Filed Aug. 11, 1978, Ser. No. 933,075

Int. Cl.[2] E02F *3/76*

U.S. Cl. 37—117.5 **4 Claims**



1. A set of bulldozer teeth adapted to be secured to a bulldozer blade in either a deployed or undeployed position, comprising:

a rigid, rectangular frame;

fastening means for pivotally securing a first edge of said frame adjacent the upper edge of said bulldozer blade, said fastening means including a tubular mounting sleeve secured to the first edge of said frame and a pair of forwardly projecting hangers fastened to the upper edge of said blade at opposite sides thereof, each of said hangers receiving a pin projecting from opposite ends of said mounting sleeve such that said frame may be pivoted between said deployed position in which said frame lies along the front face of said blade and said undeployed position in which said frame projects upwardly above the upper edge of said blade;

a plurality of teeth extending from a second edge of said frame opposite said first edge, said teeth projecting away from said frame beyond the lower edge of said bulldozer blade when said frame is in its deployed position; and

locking means for releasably securing said frame in its undeployed position.

4,241,526

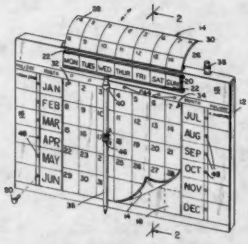
PERPETUAL CALENDAR

Nathan Poritz, 90 Greenwich Ave., New York, N.Y. 10001

Filed Nov. 19, 1979, Ser. No. 95,617

Int. Cl.[3] G09D *3/00*

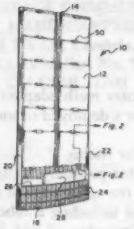
U.S. Cl. 40—110 **10 Claims**



1. A perpetual calendar including a display board, grid means on the display board for indicating divisions within a monthly time frame, tab means having indicia representative of respective days in a week, said tab means being slidably mounted on the display board in sequential arrangement for alignment with selected related grid divisions corresponding to a day of the week, indicator means for cooperative interaction

with the display board for denoting a particular month of the year, writing means including an elongated writing instrument, said writing instrument being removably attachable to the display board for recording information on the grid means, said writing instrument further including indexing means for referencing a particular day in the month, said indexing means being adjustably positionable relative to the writing instrument.

4,241,527
DISPLAY CURTAIN
James L. Becker, 3005 Waterford Dr., Cinnaminson, N.J. 08077
Filed Feb. 16, 1978, Ser. No. 878,241
Int. Cl.³ G09F 1/10
U.S. Cl. 40—124.2 **5 Claims**

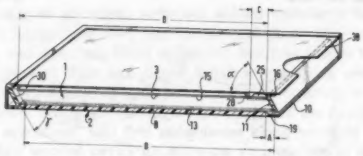


1. A display device comprising:
a curtain, said curtain being comprised of a plurality of rod shaped elements connected together side by side such that said elements are adapted to lie substantially in the same plane and such that a small space remains between each adjacent pair of elements;
a plurality of clips adapted to be affixed to said curtain, each of said clips including a substantially straight tang having a thickness sufficiently small so that it can pass through one of said spaces, each of said clips further including a ledge adapted to rest on the rod shaped element immediately below said space and a flange portion, said flange portion carrying a holding means adapted to hold the item desired to be displayed by the display device, and
a plurality of additional clip means, said additional clip means including first and second hook shaped members and an elongated elastic member connecting such first and second hook shaped members, each of said first hook shaped members being adapted to engage one of said rod elements.

4,241,528
PICTURE VIEWER
Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Filed Sep. 18, 1978, Ser. No. 943,369
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742350
Int. Cl.³ G09F 11/30
U.S. Cl. 40—513 **21 Claims**

1. A picture viewer for a pile of pictures, comprising enclosure means including a frame defining a viewing window and a slider reciprocably mounted on the frame, the frame and slider having relative obverse and reverse sliding movements in opposite directions along the window, the enclosure means also defining a picture compartment having one end adjacent the window to contain a pile of pictures with a picture at one end disposed at said one end of the compartment and adjacent the window,
a pressure means on the enclosure means and confronting the window at the compartment to press the pile of pictures against the viewing window,
a picture changing mechanism adjacent the picture compartment for removing an individual picture from one end of the pile and returning the individual picture to the other end of the pile in response to such relative obverse and reverse movement of the frame and slider to present a new picture at the window for display,
said picture changing mechanism including a pile transporter and an individual picture transporter, one of the transporters being connected with the frame and movable therewith and the other of the transporters being connected with the slider and movable therewith, the pile transporter being disposed at one side of the compartment to engage one side of the pile of pictures, the picture transporter being disposed at one end of the compartment to engage such an individual picture at the corresponding end of the pile of pictures, the transporters producing relative movement of the pile of pictures and of the individual picture during changing of the picture at the window, and
a disabling device having functional connection with the pressure means and acting to alternately effect relief and application of pressure on the pile of pictures during operation of the picture changing mechanism to facilitate the change of pictures.

4,241,529
PICTURE VIEWER
Max Baur, Kollbrunn, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Filed Sep. 18, 1978, Ser. No. 943,471
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745214
Int. Cl.³ G09F 11/30
U.S. Cl. 40—513 **100 Claims**



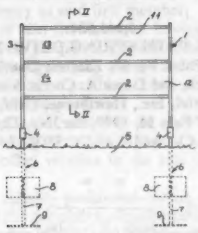
1. A picture viewer for the alternate exposure of individual rectangular sheets from a pile of sheets, comprising an enclosure having a viewing window and a compartment with sufficient depth to accommodate such a pile, one end of the compartment being disposed at the window to display a sheet through the window, another side of the compartment having an access opening, means permitting separation of one sheet from one end of said pile and adding it to said pile at the other end thereof, said means including: pile support means opposite said viewing window and pile suppression means adjacent said window, a separator bar extending parallel to congruent edges of said sheets in said pile and having a first edge opposite said window and a second edge adjacent thereto, said separator edges being spaced from each other such that removal and insertion slots are defined between respective separator edges and compartment walls confining said access opening, said pile support means and said pile suppression means being spaced from each other by a distance exceeding the distance by which said separator edges are spaced from each other, the separator bar further having a first oblique face confronting said congruent sheet edges and a second oblique face opposite said first

face, both said separator faces extending between said first and said second separator edge, whereby a sheet to be separated from said pile and thrust edgewise against said separator is deflected away from said pile permitting it to be fed through one of said slots and whereby a sheet when added to said pile after being fed through one of said slots will be retained by said separator bar at its edge adjacent the latter.

4,241,530
SIGN POST

Ole K. Hartvig, Motelvej 57, DK-400 Roskilde, Denmark

Filed Feb. 15, 1979, Ser. No. 12,365
Int. Cl.[3] G09F *15/00*
U.S. Cl. 40—607 3 Claims

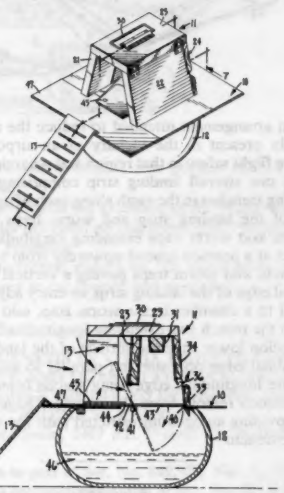


1. A sign post comprising vertically and horizontally extending hollow frame elements which are mutually connected so as to form one or more compartments for signboards, each horizontal frame element at each end thereof including a securing member, each of said securing members including a foot inserted into and secured in the end of the corresponding horizontal frame element and a crosspiece connected thereto by means of a body part having a width smaller than the width of said crosspiece so as to form recesses between said foot and the ends of said crosspiece extending laterally with respect to said body part; each vertical frame element having a number of openings in a side wall thereof and corresponding to the number of horizontal frame elements of said sign post, each of said openings having generally the same shape as the cross section of each of the crosspieces of said securing members so as to receive one of said crosspieces in each of said openings; a locking rail being movably arranged in each of said vertical frame elements, each of said locking rails being provided in one side thereof with a number of openings corresponding to the number of openings in the corresponding vertical frame element, each of said openings in said locking rail consisting of a first part having generally the same shape as the openings in the side wall of said vertical frame element, and a second opening part extending vertically from the top of said first opening part and having a width generally corresponding to the width of the body parts of said securing members and a height at least corresponding to the height of said body part, each of said locking rails, moreover, comprising wedge-shaped cam means, one provided along each side of each of said vertically extending second opening parts and with the smaller ends of said cam means pointing towards the laterally extending upper edges of said first opening parts, each of said wedge-shaped cam means having a thickness at the blunt end of each cam means which exceeds the width of said recesses in said securing members, each of said locking rails being movable in the longitudinal direction of the corresponding vertical frame element with said side of said rail, wherein said openings of said rail are provided in sliding contact with the inner surface of said wall of the corresponding vertical frame element wherein said openings of said vertical frame element are provided, each of said locking rails, moreover, being movable from a position in which said first opening parts of said openings in said locking rail register with said wall openings and to a position wherein said cam means of said locking rail engage said recesses in said securing members.

4,241,531
MOUSE TRAP

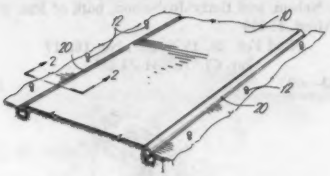
Alfred O. Nelson, and Betty Jo Nelson, both of Rte. #1 Reed Point, Mont. 59069

Filed Feb. 28, 1979, Ser. No. 16,317
Int. Cl.[3] A01M *23/04*
U.S. Cl. 43—69 1 Claim



1. An animal trap comprising, in combination:
a container of liquid;
a platform over said container having a central opening;
an upwardly converging bait chamber around said opening including first and second opposite inperforate walls, a closed top, a third wall open for a predetermined distance above said platform as a low entrance to said chamber, and a fourth wall opposite said third wall and having a slot to enable circulation of air from said entrance through said chamber, said first and second walls and said top extending beyond said third wall to comprise an open-ended approach to said entrance, and said entrance not being narrow enough to prevent a rodent from turning therein;
a shutter;
means movably mounting said shutter at said opening for pivotal movement about a horizontal axis from a first position, in which a first portion of said shutter closes said opening and a second portion of said shutter overlies said platform to comprise an entrance floor for said chamber, and a second position, in which said first portion of said shutter slopes downwardly to unclose said opening and said second portion slopes upwardly to contact the lower edge of said third wall and close said entrance, at least the inner surface of the said walls and said shutter being of material on which animal claws can find no purchase;
means normally maintaining said shutter in said first position in the absence of additional weight on the surface of said first portion thereof;
means for securing bait within said chamber above said opening and said first portion of said shutter; and
bumper means for muffling the sound of operation of said shutter into said second position.

4,241,532
WORM TRAP
Vincent S. Fancy, 372 Bay St., Ottawa, Ontario, Canada
Filed Feb. 26, 1979, Ser. No. 14,816
Int. Cl.[3] A01M *1/22*
U.S. Cl. 43—112 **2 Claims**

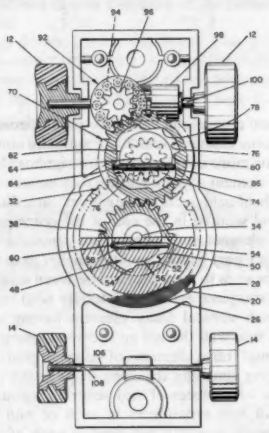


1. An arrangement intended to reduce the number of birds normally present in the vicinity of an airport and thereby improve flight safety in that region and wherein the airport has at least one aircraft landing strip comprising: longitudinally extending trenches in the earth along each of opposed marginal edges of the landing strip and worm traps located in said trenches, said worm traps extending longitudinally along said trenches at a position spaced upwardly from a bottom wall of the trench, said worm traps having a vertical wall abutting a marginal edge of the landing strip, an entry adjacent said vertical wall to a chamber in the worm trap, said entry being located in the trench and extending longitudinally therealong at an elevation lower than the surface of the landing strip, and a longitudinal edge opposite and parallel to said vertical wall, said latter longitudinal edge being spaced from a vertical wall of the trench remote from the marginal edge of the landing strip providing an open unrestricted path for worms to crawl into the trench.

4,241,533
AERIAL TOY GLIDER
Reginald W. Newsome, 216 Philray Rd., Richmond, Va. 23229
Filed Mar. 16, 1979, Ser. No. 21,117
Int. Cl.[3] A63H *33/18*
U.S. Cl. 46—74 D **7 Claims**

1. An aerial toy glider adapted to be thrown through the air and having an aerodynamic lifting surface comprising:
a peripherally arcuate rod-like rim member of resilient foam material with elastic memory characteristics;
a peripherally arcuate, substantially tubular rim retaining member of flexible material for receiving said rim member;
said rod-like rim member lying within said rim retaining member;
means for securing said rim member within said rim retaining member;
a peripherally arcuate disc-like body member of flexible, non-resilient material;
means for securing said rim retaining member and said rim member to said body member along a line of common periphery of said rim retaining member; said rim member being made of material of sufficient rigidity so that said glider may be folded for storage in a restricted space and then return to its original shape upon being unfolded, based on the said memory characteristics of said rim member;
said disc-like body member being made of a diameter larger than the inner diameter of said rod-like rim member;
said larger diameter of said disc-like body member being made of a preselected magnitude so that on being deflected by air resistance during flight, said disc-like body member becomes dished in a vertical direction along an axis normal to the horizontal plane of said disc so that an annular recess is formed adjacent said rim near the junction of said body member and said rim retaining member forming an angle at said junction for providing an area of lowered pressure behind and adjacent the rim member as said disc is thrown through the air.

4,241,534
TOY VEHICLE WITH SPRING DRIVE MECHANISM
Ake L. Larsson, Palos Verdes Estates; Gunther E. Gronwold, Manhattan Beach, and Derek A. Corris, Venice, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 14, 1979, Ser. No. 12,085
Int. Cl.[3] A63H *29/20*; F03G *1/10*
U.S. Cl. 46—206 **11 Claims**



1. In a toy vehicle, the combination comprising:
a chassis;
at least one drive wheel coupled for rotation relative to said chassis, said at least one drive wheel being configured for engaging a surface;
spring means within the chassis;
a first gear pair having first and second gear members mounted for rotation about a first axis, one of said first and second gear members being operatively coupled to said spring means for storing energy in said spring means when rotated in a first direction and for releasing energy from said spring means during rotation in a second direction;
a second gear pair having third and fourth gear members mounted for rotation about a second axis generally parallel to said first axis, said first and third gear members being in meshing relation, and said second and fourth gear members being in meshing relation;
coacting means integrally formed in adjacent surfaces of said first and second gear members for providing a first unidirectional clutch means for concurrent rotation between said first and second gear members only in a first direction;
coacting means integrally formed in adjacent surfaces of said third and fourth gear members for providing a second unidirectional clutch means for concurrent rotation be-

tween said third and fourth gear members only in a direction opposite to said first direction; and

means interconnecting said at least one drive wheel with one of said third and fourth gear members, said third and fourth gear members being so dimensioned for providing a first gear ratio for driving said one of said first and second gear members in said first direction with said at least one drive wheel rollingly engaging a surface in the reverse direction of travel of said vehicle and for providing a second gear ratio for propelling said vehicle on a surface with said one of said first and second gear members rotating in said second direction under force of said spring means

10. In a mechanism, the combination comprising:

a first gear member mounted for rotation about an axle;

a second gear member mounted for rotation about the same axle in proximity to said first member;

a first surface of said first member having a recess formed therein with the periphery thereof contoured for providing a plurality of generally identical curved surfaces with each surface having a gradually contoured portion and an abruptly contoured portion;

an adjacent surface of said second member having a part thereof extending within said recess, said part having a slot therein offset relative to the axis of rotation of said axle;

a pin member slidably positioned within said slot, said pin member and the periphery of said recess being configured for enabling one end of said pin member to engage said abruptly contoured portions of one of said surfaces for driving said first and second members concurrently in a first direction of rotation and for enabling said pin member to generally slide over said gradually contoured portions upon rotation of one of said members in the opposite direction whereby to provide a unidirectional clutch mechanism;

a second axle generally parallel to the first axle;

third and fourth gear members mounted for rotation about said second axle, said first and third gear members being in meshing relation, and said second and fourth gear members being in meshing relation, adjacent surfaces of said third and fourth gear members being generally identically configured to the adjacent surfaces of said first and second gear members but in inverted relation relative thereto for providing a second unidirectional clutch mechanism for concurrently driving said third and fourth gear members in a direction opposite to the direction of concurrent rotation of said first and second gear members;

a rotatable member; and

means interconnecting said rotatable member to one of said third and fourth gear members, said first, second, third and fourth gear members being so dimensioned for providing a first gear ratio in one direction of rotation of said rotatable member and a second gear ratio in the opposite direction of rotation thereof.

4,241,535

SUBMERSIBLE TOY

Mitsuo Tsukuda, Tokyo, Japan, assignor to Kabushiki Kaisha Tsukuda Hobby, Tokyo, Japan

Filed Sep. 21, 1979, Ser. No. 77,745

Claims priority, application Japan, Feb. 1, 1979, 54-10791

Int. Cl.³ A63H *23/04*

U.S. Cl. 46—250 **4 Claims**

1. A submersible toy comprising:

an upper body portion;

a liquid-tight lower body portion;

said upper body portion being coupled to said lower body portion through connecting means;

a first horizontal rudder provided on said upper body portion;

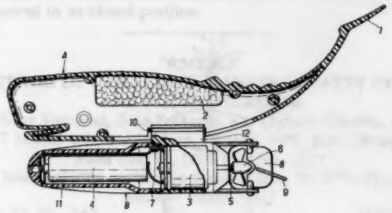
a second horizontal rudder provided on said lower body portion;

said first horizontal rudder on the upper body portion being disposed at a position substantially vertically above said second horizontal rudder on the lower body portion;

a float provided inside said upper body portion;

a motor and a cell provided inside said liquid-tight lower body portion;

said motor having a rotary shaft which has an extension



projected outwardly from a rear portion of said lower body portion;

a propeller provided on the extension of the rotary shaft; and

a vertical rudder provided on said lower body portion at the rear of said propeller;

said second horizontal rudder on the lower body portion being disposed at the rear of said propeller.

4,241,536

EMBRYOGENESIS IN VITRO, INDUCTION OF QUALITATIVE AND QUANTITATIVE CHANGES IN METABOLITES PRODUCED BY PLANTS AND PRODUCTS THEREOF

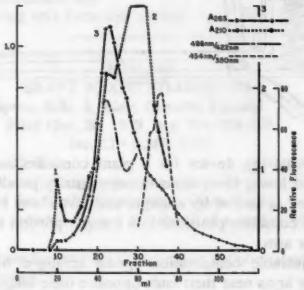
Annette R. Saint-Firmin, 2407 #L. Wesvill Ct., Raleigh, N.C. 27607

Continuation-in-part of Ser. No. 849,952, Nov. 9, 1977, abandoned, and a continuation-in-part of Ser. No. 849,953, Nov. 9, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,681

Claims priority, application United Kingdom, Nov. 10, 1976, 46866/76; Nov. 19, 1976, 48403/76

Int. Cl.³ A01G *31/00*; C12K *9/00*

U.S. Cl. 47—58 **20 Claims**



2. The process of embryogenesis in vitro comprising inducing tumor formation in a plant to produce mitotic cells, rejuvenating the mitotic cells in vitro to produce embryonic cells by means of a controlled environment, wherein the temperature range is from about 12° to 27°C., the light energy level is from about 2,000 to 400,000 ergs per sq. cm. per second, the spectral range is up to about 730 nm., for a selected photoperiod, and in a suitable nutrient medium, differentiating the embryonic cells to obtain therefrom embryos.

4,241,537

PLANT GROWTH MEDIA UTILIZING POLYURETHANE HYDROGEL

Louis L. Wood, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 10, 1979, Ser. No. 37,928
Int. Cl.[3] A01G 9/10
U.S. Cl. 47—77 23 Claims

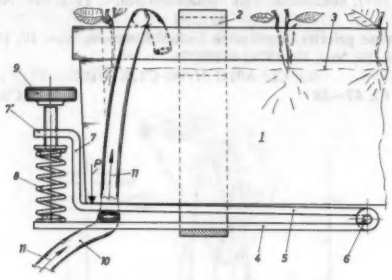
1. A soil plug comprising a plant growth in an aqueous gel of a monolithic, crosslinked, hydrophilic polyurethane.

4,241,538

DEVICE FOR AUTOMATICALLY WATERING PLANT CONTAINERS

Helmut Lahr, Gansmarkt 12, 65 Mainz-Bretzenheim, Fed. Rep. of Germany

Continuation of Ser. No. 814,318, Jul. 11, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,604
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632347
Int. Cl.[3] A01G 27/00
U.S. Cl. 47—79 1 Claim



1. A watering device for a plant container consisting of upper and lower lever arms in substantially parallel relationship joined at an end by a hinge, said lower arm being fixed;

a plant container positioned on a major portion of the upper lever arm;

an adjustable compression spring arranged between the lever arms near their ends opposite their hinged ends, the spring engaging said lower arm and the lower portion of an adjusting screw urging the lever arms in opposite angular directions;

said adjusting screw located beside the container and having an upper control portion which extends above said upper lever arm, and a connecting portion which passes through and threadably engages the upper lever arm and connects with said lower portion to increase or decrease the compression on the spring;

a flexible hose extending transversely between the lever arms and having an end communicating with the plant container such that a fluid flowing through the hose will be deposited in the container;

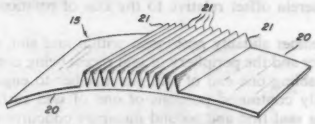
whereby fluid flows through the hose to fill the container to a predetermined weight at which time the combined weight of the fluid, container, and upper lever arm compress the spring and drives the two lever arms together to pinch the hose thereby stopping or reducing the flow of fluid therethrough and whereby adjustment of the screw permits the adaption of the watering device to plant containers of different weights.

4,241,539

SEAL FOR SIDES OF PIVOTED BLADE STRUCTURES

Louis Josephson, Yonkers, N.Y., assignor to American Hardware & Paint Co., Inc., Elizabeth, N.J.

Filed Jan. 18, 1979, Ser. No. 4,488
Int. Cl.[2] E06B 7/23, 7/098
U.S. Cl. 49—91 7 Claims



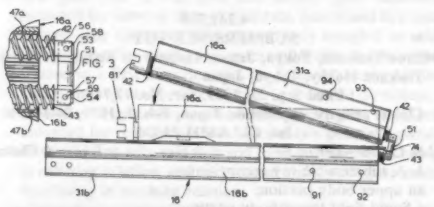
1. A laterally curved relatively rigid side seal strip having centrally positioned on the portruding portion of the curve a series of laterally spaced soft and flexible longitudinally extending teeth, said strip being a longitudinally straight slat-like extrusion in which the curved body portion of the strip is formed from hard plastic, and the teeth are formed of soft plastic, the lateral curvature of said strip having a radius of the width of the strip up to about 3 times the width of the strip and the upper reach of the teeth being approximately level.

4,241,540

FOLDING SCREW AND RAIL ASSEMBLY FOR A GARAGE DOOR OPENER

Warren B. Depperman, Waterloo, Iowa, assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Jul. 18, 1979, Ser. No. 58,678
Int. Cl.[3] E05F 11/00
U.S. Cl. 49—199 10 Claims



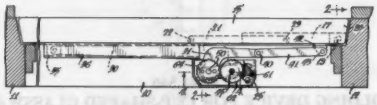
1. A garage door opener comprising, a movable trolley with a worm engaging portion coupled to said door to move it up and down, a pair of worm shafts mounted end to end and said worm engaging portion of said trolley engageable therewith, and means pivotally connecting the adjacent ends of said worm shaft together so that in the unassembled position said worm shaft can be folded along side each other.

4,241,541

DUAL ARM OPERATOR FOR A CASEMENT-TYPE WINDOW

Marlo G. Van Klompenburg, Sioux Center, Iowa; Jeffery A. Peterson, Canby, and Eric W. Nelson, Minneapolis, both of Minn., assignors to Truth Incorporated, Owatonna, Minn.

Filed Jun. 8, 1979, Ser. No. 46,800
Int. Cl.[3] E05F *11/24*
U.S. Cl. 49—249 9 Claims



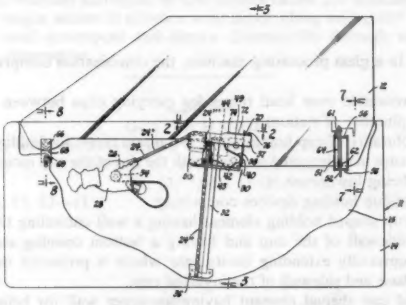
1. An operator for a casement-type window having an openable sash mounted adjacent one edge thereof for combined pivoting and linear movement of said sash edge relative to a window frame comprising, a first operator arm rotatable about a fixed axis and having an end adapted for movable engagement with the sash at a distance from said one edge to impart a rotational force to said sash, a second operator arm, a connecting link pivotally connected to said second operator arm and pivotally connectable to said sash adjacent said edge, and means responsive to rotation of the first operator arm for rotating and bodily moving said second operator arm to exert a force on the connecting link acting in a direction generally parallel to the path of linear movement of said sash edge.

4,241,542

VEHICLE DOOR WINDOW ASSEMBLY

Edward G. Podolan, and Francis C. Przybysz, both of Utica, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1978, Ser. No. 950,629
Int. Cl.[3] E05F *11/48*
U.S. Cl. 49—352 4 Claims



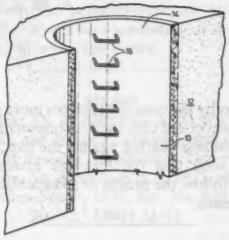
1. In a door having a window arranged between inner and outer panels thereof for opening and closing a window opening cooperatively defined by the door and a vehicle body with an outwardly facing seal, tape drive regulator means connected in said door between said inner panel and said window for moving said window between open and closed positions with respect to said opening comprising a straight slide pole fixed to said inner panel and extending parallel to the direction of movement required of said window in moving across said opening between its open and closed position, actuator means fixed to said inner panel, a track fixed to said inner panel and extending from said actuator means and along said slide pole, a tape slidably mounted in said track and drivingly connected to said actuator means, first yoke means slidably mounted on and guided by said slide pole and drivingly connected to said tape, second yoke means fixed to said window, and pivot means pivotally connecting said second yoke means to said first yoke means so that said window can pivot about an axis transverse to said slide pole to bear against said seal, and combination window guide and lateral stabilizing means on said inner panel and said window operably engageable only during movement of said window adjacent its closed position for guiding said window by camming action to pivotally bear against and then be laterally restrained with respect to said seal as said window is moved to its closed position.

4,241,543

METHOD OF INSTALLING MANHOLE SAFETY STEPS AND PLUGS THEREFOR

Anthony Foscarini; John Foscarini, and Corrado Comelio, all of 17 Malley Rd., Scarborough, Ontario, M1L 2E4, Canada

Filed Jan. 30, 1979, Ser. No. 7,672
Claims priority, application Canada, Dec. 20, 1978, 318,298
Int. Cl.[3] E02D *29/12*
U.S. Cl. 50—742 12 Claims



1. A method of manufacturing a concrete manhole casing comprising:
(a) fabricating a form of a predetermined shape;
(b) securing a plurality of retractable arbors on the inside surface of said form, each arbor located on the surface of said form at a predetermined location;
(c) extending each arbor through said form;
(d) placing a plug on the end of each arbor;
(e) pouring concrete into said form;
(f) vibrating and compacting said poured concrete;
(g) retracting said arbors leaving said plugs in said compacted concrete; and
(h) removing said form and arbors.

4,241,544

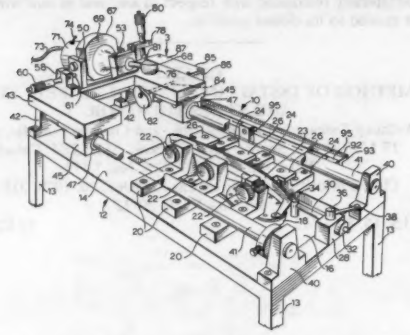
SKATE BLADE SHARPENER

Joseph Hampton, R.R. 1, King, Ontario, Canada

Filed Oct. 30, 1978, Ser. No. 955,635
Int. Cl.[3] B24B *9/04*
U.S. Cl. 51—33 R 7 Claims

1. A skate sharpening apparatus, comprising:
first means for firmly supporting a skate blade,
a grinding member having the shape of a surface of revolution,
power means for rotating the grinding member about its axis of symmetry,
second means supporting the power means for pivoting movement about a pivotal axis transverse to said axis of symmetry, the pivotal axis being spaced from the grinding member,
guide means for allowing relative translational movement between the first means and the second means,
and cam means controlling the pivotal position of the power means as a function of the translational position of the first means relative to the second means, the cam means being such as to cause the grinding member to follow a locus corresponding to a pre-determined skate blade profile, said cam means including a gear rack fixed with respect to

said first means, a pinion meshing with and rolling on said rack, the pinion axis being transverse to the direction of translational movement and being fixed with respect to said second means; and means including a reduction gear mechanism for applying the rotation of said pinion to a cam shaft whose axis is fixed with respect to the second



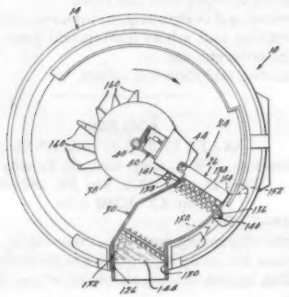
means whereby the cam shaft rotates more slowly than the pinion, a cam on said cam shaft, a follower mounted on the power means and bearing against the cam, the cam being contoured such that the follower causes the grinding member to follow the profile of a skate blade supported in said first means.

4,241,545

SEPARATING AND UNLOADING DEVICE FOR VIBRATORY FINISHING MACHINES

Gordon H. Anderson, Albert Lea, and Steven R. Johnson, Hayward, both of Minn., assignors to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Dec. 4, 1978, Ser. No. 965,922
Int. Cl.³ B24B *31/06*
U.S. Cl. 51—163.2 **33 Claims**



1. In combination with a vibratory finishing machine comprising a generally circular finishing chamber adapted to be subjected to vibratory movement whereby workpieces and finishing media move about a generally circular path during a finishing operation,

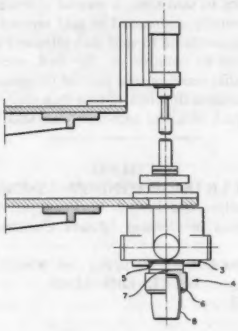
a workpiece separating and unloading device including a weir element arranged generally transversely of said path of movement of the workpiece-media mixture within the chamber, means supporting said element for upward and downward pivotal movement about a generally horizontal pivotal axis, whereby said weir may be moved into and out of said path of workpiece and media movement, said last mentioned means comprising a pivot arm secured to said weir and extending generally radially of said finishing chamber, and means disposed generally centrally of said finishing chamber for supporting said shaft for pivotal movement about said horizontal pivotal axis for rotational movement about the axis of said shaft.

4,241,546

HOLDING DEVICE FOR CUP-SHAPED GLASSWARE ARTICLES IN A GLASS PROCESSING MACHINE

Emil Ilk, Ahornweg 4, 8372 Zwiesel, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,132
Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823088; May 26, 1978, 7815846[U]
Int. Cl.³ B24B *9/12*
U.S. Cl. 51—227 R **3 Claims**



1. In a glass processing machine, the combination comprising:

a rotatable over head turret for carrying cups between a plurality of stations,

a plurality of cup holding devices on said turret for holding cups in an inverted position with the rim of the cup mouth being lowermost,

said cup holding devices comprising:

a cup shaped holding element having a wall encircling the sidewall of the cup and having a bottom opening and upwardly extending cavity into which is projected the base and sidewall of the inverted cup,

said cup shaped element having an upper wall for being positioned adjacent to the inverted bottom wall of the cup,

an upper base portion on said holding element for securing to a rotating holder portion of the glass processing machine,

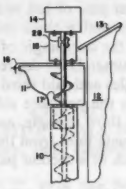
and a circumferential sealing ring on the encircling wall of said holding element for contacting the exterior surface of the sidewall of the cup,

said circumferential sealing ring having sealing engagement with the cup's sidewall to define a chamber thereabove and across the top of the inverted cup bottom wall to provide a vacuum chamber across the entire upper portion of the inverted cup, and means for establishing a vacuum in said chamber in the space between said inverted cup bottom wall and the cup side wall extending down to said sealing ring.

4,241,547
RAINWATER DUCTING SYSTEM

Louis J. Bove', 10131 Epsilon Rd., Richmond, Va. 23235

Filed Apr. 9, 1979, Ser. No. 28,475
Int. Cl.[3] E04D *13/00*
U.S. Cl. 52—11 7 Claims



1. A rainwater ducting system for use adjacent the eaves of a building comprising:

(a) a horizontally disposed open gutter trough located beneath the terminal edge of a roof of said building in a manner to receive rainwater therefrom, horizontally directed auger means positioned within said trough adapted for rotative movement therein without contact with the inside walls of said trough, a first electric motor supported by said trough and operatively coupled to said auger means, and

(b) a vertically disposed tubular downspout communicating with said trough adjacent at least one end thereof, vertically directed auger means positioned within said downspout depending from attachment with a second electric motor mounted atop said trough and positioned directly above said downspout,

(c) said horizontally directed and vertically directed auger means each occupying less than 50% of the cross-sectional areas of said trough and downspout respectively,

(d) said first and second motors being of waterproof design and capable of variable forward and reverse speeds, and

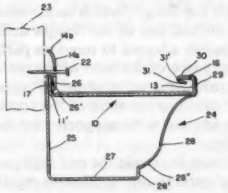
(e) electrical control means for said motors located within said building remote from said trough and downspout,

(f) whereby activation of said motors causes the associated auger means to advance solid debris along said gutter to said downspout and thence downwardly through said downspout.

4,241,548
GUTTER HANGER

Lacy A. Rowe, 1851 Skycoe Dr., Salem, Va. 24153

Filed Nov. 27, 1979, Ser. No. 97,676
Int. Cl.[3] E04D *13/00*
U.S. Cl. 52—11 9 Claims

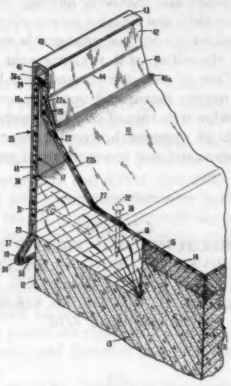


1. A one-piece gutter hanger for supporting an open top, trough-shaped rain gutter adjacent to the eaves of a building, the gutter being of a type comprising a flat rear wall having an inwardly and downwardly reversely bent upper edge portion forming a downwardly open rear gutter hook, a bottom wall extending forwardly of the rear wall, a front wall extending upwardly from the bottom wall opposite the rear wall and having an upper wall portion, a horizontal flange extending inwardly from the top of the upper wall portion terminating in a downwardly and forwardly reversely bent edge portion to form a downwardly and forwardly open front gutter hook, said gutter hanger comprising an elongated body portion of a length to span the open top of the gutter, hook means at one end of the body portion for inter-engaging the front gutter hook, and an upstanding support portion formed integrally with the other end of the elongated body portion, said upstanding support portion including an inwardly offset main portion and at least one upstanding tongue struck therefrom and bent upright from said elongated body portion, said tongue being spaced outwardly from the inwardly offset main portion of said upstanding portion and adapted to seat in the rear gutter hook, said main portion of said upstanding portion being longer than said tongue so as to extend above the top edge of a gutter when the tongue is seated in the rear gutter hook, and a hole through the main portion of said upstanding portion above said tongue for receiving a nail, said hole being spaced relative to said tongue so that when the tongue engages the rear gutter hook and the front hanger hook engages the front gutter hook, a nail driven through said hole into a vertical building surface beneath the eaves will draw the gutter and hanger tight against the vertical wall and lock the hanger relative to the gutter to prevent separation of the hanger from the gutter without piercing the gutter.

4,241,549
CONJOINT FACIA, FLASHING AND WATER DAM

James H. Hall, III, and Julian J. Attaway, both of Tucker, Ga., assignors to MM Systems Corporation, Tucker, Ga.

Continuation of Ser. No. 831,976, Sep. 9, 1977, abandoned. This application Sep. 7, 1978, Ser. No. 940,339
Int. Cl.[2] E04D *13/15*
U.S. Cl. 52—60 12 Claims



1. In a conjoint facia, flashing and water dam for being installed on a building adjacent to a wall and roof deck of said building, the combination which includes; facia and flashing means comprising, facia means, flashing means and longitudinal ridge structure interconnecting said facia means and said flashing means to have said facia means laterally extend generally vertically adjacent to said building wall, said facia and flashing means, as installed, being externally laterally re-entrant along the rear of said ridge structure thereof and over said flashing means to have said flashing means extend rearwardly and downwardly from said ridge structure of said facia and flashing means toward said roof deck, and said facia means having engageable means for being detained; and dam and detent means comprising, dam means adapted to extend behind said facia means and including longitudinal ridge structure supported to stay in a substantially fixed position above said roof deck after said dam means has been installed, and said dam means, as installed, being laterally externally re-entrant along

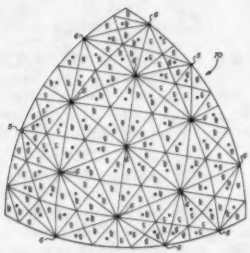
the rear of said ridge structure of said dam means and over a surface of said dam means leading rearwardly and downwardly from said ridge structure of said dam means toward said roof deck, said surface of said dam means to support sheet roofing having the latter lead upward from said roof deck and beneath said flashing means for said flashing means pressing upon said sheet roofing to have upward reactive thrust for lifting said ridge structure of said facia and flashing means, and detent means adapted to be connected with said building so as to be in a position below said ridge structure of said dam means, and said ridge structures of said facia and flashing means and said dam means together forming upper tongue and grooved means comprising upper tongue means and upper grooved means and said engageable means and said detent means together including lower tongue and grooved means comprising lower tongue means and lower grooved means, for said facia and flashing means to be moved laterally downwardly onto said dam means having said upper tongue means and said upper grooved means relatively moving stably engaged laterally with one another in each of opposite horizontal directions and thus stabilizing said ridge structure of said facia and flashing means laterally in each of opposite horizontal directions, and thereby causing said flashing means with continued downward movement of said facia and flashing means to press said sheet roofing against said surface of said dam means and store upward reactive thrust and disposing said lower tongue means and said lower grooved means to be upwardly relatively moved, and thereby become engaged, through having said facia and flashing means move upwardly in response to said upward reactive thrust stored in said flashing means, and thus have said upper tongue means and said upper grooved means engaged and relatively moving simultaneously with said lower tongue means and said lower grooved means being engaged and relatively moving and said upward movement of said facia and flashing means eventually stopped by said detent means against said engageable means, with said flashing means thereafter still pressing said sheet roofing against said surface of said dam means, said laterally stably engaged upper tongue means and upper grooved means still stabilizing said ridge structure of said facia and flashing means laterally in each of opposite horizontal directions and said lower tongue means and said lower grooved means remaining engaged.

4,241,550

DOMICAL STRUCTURE COMPOSED OF SYMMETRIC, CURVED TRIANGULAR FACES

John S. Sumner, 728 N. Sawtelle, Tucson, Ariz. 85716

Filed Jun. 23, 1978, Ser. No. 918,448
Int. Cl.[2] E04B *7/10*
U.S. Cl. 52—81 **3 Claims**



1. A method for subdividing a symmetric right spherical triangle comprised of an arcuate hypotenuse and two arcuate sides to obtain surface elements for a domical structure comprising the steps of:

bisecting the 60 degree angle of an approximately 90°–60°–36° spherical triangle with a first arc that intersects the opposite side of the spherical triangle,

drawing a first arcuate line from this intersection to the hypotenuse of the triangle,

said arcuate line meeting said hypotenuse of the spherical triangle at approximately a 90 degree angle,

said first arc and said first arcuate line dividing the spherical triangle into a first pair of left and right handed smaller spherical triangles and a third triangle having an apex angle the same as the apex angle of said spherical triangle,

bisecting the approximately 60 degree angle of each of said first pair of triangles and said third triangle with a second arc that intersects the opposite side of each first pair of triangles and said third triangle, and

drawing second arcuate lines from these intersections to the hypotenuse of each of a second pair of triangles and said third triangle,

said second arc meeting the hypotenuse of each of said second pair of triangles and said third triangle at approximately a 90 degree angle,

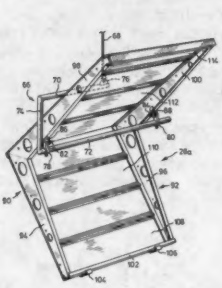
thereby dividing each of said second pair of triangles and said third triangle into two similar triangles and further third triangles with said third triangles each having an apex angle the same as the triangle from which it is formed.

4,241,551

BUILDING STRUCTURE

Marcel Lajoie, R.R. #1, and Bernard Lajoie, R.R. #2, both of Sombra, Canada (N0P 2H0)

Filed Mar. 5, 1979, Ser. No. 17,212
Int. Cl.[3] E04B *1/343*
U.S. Cl. 52—90 **7 Claims**



1. A building structure comprising:

a base frame adapted to defining a rectangle in plan view after assembly, the base frame including coplanar inner and outer top flanges which on assembly define a horizontal top surface, one of the flanges defining notches;

end wall panels adapted to stand on parts of the top surface defined by two of the sides of the rectangular base frame;

side wall parts adapted to stand on parts of the top surface defined by the other sides of the rectangular base frame;

roof parts adapted to be supported by the side wall parts on assembly;

means adapted to couple the end wall panels, side wall parts and roof parts to one another to rigidify the structure on assembly;

and coupling elements attached in pairs to at least some of the end wall panels and the side wall parts, each pair of elements extending downwardly and attached one to the inside and one to the outside of the associated one of said panels or side wall parts, the elements being generally C-shaped and curving downwardly and towards one another for respective engagement under said inner and outer top flanges of the base frame, the notches in the base frame and the coupling elements being proportioned and positioned to permit assembly by passing one of the C-

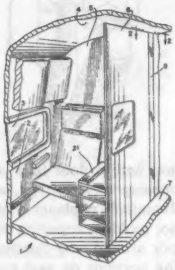
shaped elements through the notch in said one of the flanges with the other element hooked under the other of the flanges and then sliding the associated one of the end wall panels and side wall parts along the base frame into final assembled positions.

4,241,552

PARTITION WALL JOINT

Walter J. Marulic, Gary, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Mar. 27, 1978, Ser. No. 890,444
Int. Cl.[2] E04B 1/00
U.S. Cl. 52—282 **4 Claims**



1. In a passenger vehicle having compartment partition walls converging to form a wall joint, the improvement comprising a partition-wall joint adapted to secure generally adjacent vertical edge portions of first and second longitudinal partition walls and a third partition wall having a vertical edge portion generally interposed between said edge portions of said first and second walls and extending generally transversely therefrom, comprising:

a vertical anchor post generally hat-shaped in horizontal cross-section and including a channel having inner and outer portions, said inner channel portion adapted to receive the vertical edge portion of said third wall, and said post having brim flange portions extending longitudinally from said channel in spaced parallel relation to said outer channel portion and adapted to engage first sides of said first and second walls, said outer channel portion being in general alignment with second sides of said first and second walls,

an anchor plate generally co-extensive and cooperative with the post and positioned adjacent to said outer channel portion to define oppositely longitudinally opening slots formed by each brim flange portion and the anchor plate, said anchor plate adapted to engage second sides of said first and second walls and to sandwich respective vertical edge portions of the first and second walls between said flange portions and said anchor plate in generally flush relation with said outer channel portion, and

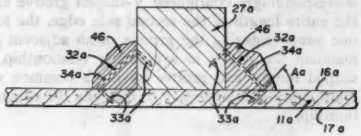
first fastening means extending from said outer channel portion into said third wall adapted to couple said post and third wall, second fastening means adapted to couple said plate and post, and third fastening means extending through said plate and into said first and second walls adapted to secure said first and second walls to the plate, said first, second and third fastening means all being accessible from the same side of the wall joint.

4,241,553

MOBILE HOME CEILING CONSTRUCTION AND METHOD FOR MAKING

James E. Reicherts, Oakwood Hills, and William C. Veschuroff, Palatine, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Feb. 5, 1979, Ser. No. 8,919
Int. Cl.[3] E04B 5/52
U.S. Cl. 52—309.5 **32 Claims**



1. A mobile home ceiling unit comprising:

a plurality of generally rectangular panels abutting along longer sides at joints in adjacent edge-to-edge relationship, having a thickness of from about 5/16 inches to about ½ inch, having planar back and front face surfaces, and said panels abutting to form an overall generally rectangular panel arrangement;

a roof frame having an outer truss member at opposite ends and a multiplicity of intermediate truss members therebetween, said truss members being spaced apart at intervals and contacting the back face surface of the panels along bottom chords, said roof frame having side edge rails fastened to opposite terminal end portions of the truss members and contacting back face surfaces of the panels;

a group of back fasteners being spaced apart at intervals and driven along at least one side of the bottom chords of the intermediate truss members wherein the fasteners incline downwardly to the plane of the back face surfaces of the panels having a first leg means penetrating a bottom chords and a second leg means penetrating the back face surface of a panel but stopping short of emerging through the front face surface thereof;

a group of front face fasteners being spaced apart at intervals along substantially the full perimeter of the rectangular panel arrangement and driven upwardly at the front face surface of said panels, said fasteners having leg means of sufficient length to extend through the panels and penetrate the side edge rails and bottom chords of the outer truss members;

at least one bead of adhesive material disposed along the bottom chords of the intermediate truss members across the back face surfaces of the panels;

wherein the panels are rigidly attached to the roof frame by said adhesive and fasteners to provide a unitized ceiling structure;

wherein the front face surface of the ceiling unit is adapted to supportively coact along the perimeter thereof atop support wall means to thereby conceal the front face fasteners and support the ceiling unit; and,

whereby the ceiling unit provides a concealed back fastened ceiling structure having unitized construction for use in mobile home construction.

4,241,554

DECORATIVE SKIRTING PANEL SYSTEM

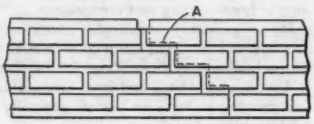
Dick S. Infantino, Cupertino, Calif., assignor to Kool Foam Products, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 824,675, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 656,487, Feb. 9, 1976, abandoned. This application Sep. 6, 1978, Ser. No. 940,059
Int. Cl.[2] E04C 2/20
U.S. Cl. 52—314 **5 Claims**

1. In a decorative skirting system for installation along a side of a mobile home which is supported above the ground, the

skirting system adapted to overlie and be held to the exterior surface of the lower portion of the mobile home sidewall and extend downwardly therefrom to the ground, the system comprising a generally coplanar plurality of panels of expanded polystyrene foam, each panel being formed with an array of rectangular projections stimulating masonry material, the improvement wherein:

each panel has uninterrupted first and second vertical side edges extending to the ground, with a V-shaped tongue extending the entire length of the first side edge, and a correspondingly configured V-shaped groove extending the entire length of the second side edge, the tongue of one panel engaging the groove of an adjacent panel to maintain the panels in a coplanar relationship, the V-shaped tongue and groove having a common specified width and depth necessary to maintain the coplanar relationship,



the uninterrupted vertical side edges permitting an individual panel to be slidably disengaged from adjacent panels without disturbing the adjacent panels by detaching the top of the panel from the mobile home sidewall and sliding the panel vertically upward a distance at least that of the height of the panel,

the V-shaped configuration of the tongue and groove providing a minimum surface area between an engaged tongue and groove for the specified width and depth and preventing binding arising from dimensional inhomogeneities, thereby facilitating the slidable disengagement; and

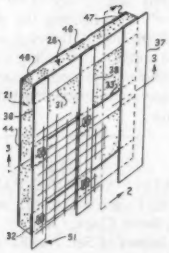
the rectangular projections are aligned in vertical columns with simulated mortar lines therebetween, such that the boundary between adjacent panels falls within a simulated mortar line and is thereby disguised.

4,241,555

COMPOSITE PANEL STRUCTURE AND METHOD OF MANUFACTURE

Luther I. Dickens, Radford, Va., and William C. Nanny, San Francisco, Calif., assignors to Radva Plastics Corporation, Radford, Va.

Continuation of Ser. No. 659,758, Feb. 20, 1976, abandoned.
This application May 30, 1978, Ser. No. 910,762
Int. Cl.[2] E04C *2/18, 2/26*
U.S. Cl. 52—454 **5 Claims**



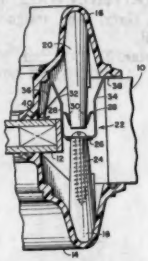
1. A composite building panel comprising a core element consisting of rigid expanded plastic material having a front and back surface, and a plurality of thin reinforcing strips bonded during expansion of said plastic material to each of said front and back surfaces of said core with a strip extending at least along each of the edges of said surfaces and extending laterally from only first and second adjacent edges of said core only on the front face thereof.

4,241,556

DOOR LIGHT ASSEMBLY

William M. Bursk, Middletown, Ohio, assignor to Pease Company, Fairfield, Ohio

Filed Nov. 9, 1978, Ser. No. 958,981
Int. Cl.[3] E06B *3/70*
U.S. Cl. 52—455 **9 Claims**



1. In combination with a door light assembly including a door having an opening therethrough, a panel positioned in said opening in substantially coplaner relationship to said door, interior and exterior molding engaging adjacent edges of said panel and said door around said opening therethrough, and inwardly projecting portions on said molding sections positioned intermediate said edges of said panel and said door, the improvement comprising:

a security clip having a substantially flat base section with an opening therethrough,

fastening means projecting outwardly from said base section through said opening, penetrating said inwardly projecting portion of said exterior molding, and securing said base section to said exterior molding, and

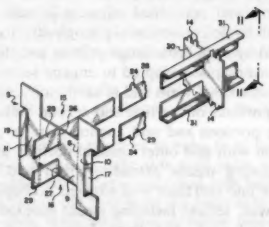
resilient gripping means projecting from said base section in a direction opposite to said fastening means and gripping said inwardly projecting portion of said interior molding.

4,241,557

CONSTRUCTION MEMBER AND PLATE THEREFOR

Keith A. Jensen, Sandy, Utah, assignor to Jensen Building Products, Inc., Pleasant Grove, Utah

Filed May 15, 1978, Ser. No. 906,067
Int. Cl.[2] E04C *3/02*
U.S. Cl. 52—696 **15 Claims**



1. A construction member comprising

an upper chord;

a lower chord;

a flat spacer lock plate or plurality of plates rigidly joining

the upper and lower chords, each spacer lock plate positioned in a direction perpendicular to the axis of the chords and having opposing upper and lower rectangular indentations of its upper and lower edges, respectively, into which indentations the upper and lower chords rest, a stem portion between the indentations which includes teeth on the upper and lower edges thereof, and flanges at each side of the indentations and stem portion and folded flush against the sides of the chords in a direction parallel to the axis of the chords; and

protrustions extending from or through the flanges and driven into the chords.

4,241,558

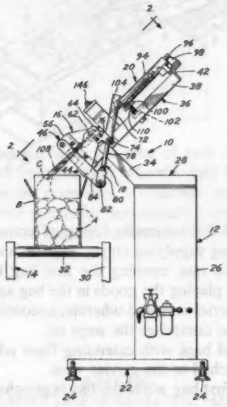
PACKAGING MACHINE

Kenneth L. Gidewall, Naperville, and James R. Proce, Palatine, both of Ill., assignors to C.V.P. Systems, Inc., Lombard, Ill.

Filed Jan. 24, 1979, Ser. No. 5,967

Int. Cl.³ B65B *31/06*

U.S. Cl. 53—79 **9 Claims**



1. Apparatus for packaging articles in a controlled atmosphere within a flexible container having an open end, said apparatus comprising, in combination, a frame, means on said frame for supporting said flexible container with said articles therein in a substantially fixed position relative to said frame, a fixed elongated member mounted on said frame and having an upwardly angled sealing surface, a movable elongated member operatively mounted on said frame and having a sealing face movable into cooperative relationship with said sealing surface of said fixed elongated member, said movable elongated member being movable between a first position which is spaced from said fixed elongated member and a second position which is adjacent said fixed elongated member, means operatively carried by said fixed elongated member for holding said flexible container in place when said movable elongated member is in said first position, means mounted on said frame for moving said movable elongated member between said first and second positions, said moving means including over-the-center linkage means for holding said movable elongated member in said second position, passage means on said frame for passage through said open end of said flexible container into said flexible container for creating said controlled atmosphere, means for moving said passage means from a first position which is positioned slightly in said open end of said container and a second position which is inserted substantially into said container, said passage means being sealably positioned between and aligned with said sealing surface and said sealing face when said movable elongated member is in said second position and said passage means is in said second position in said flexible container.

4,241,559

LOWERING AND PIVOTING RAIL MECHANISM FOR A CARTON FILLING MACHINE

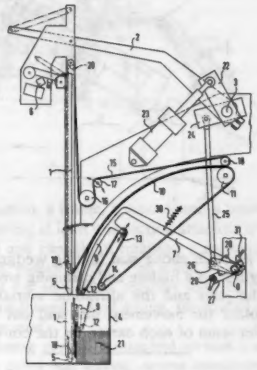
Hartmut Klapp, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,138

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1978, 2825648

Int. Cl.³ B65B *5/10*; B65H *29/14*

U.S. Cl. 53—244 **5 Claims**



1. A lowering and pivoting rail mechanism for a carton filling machine including a lower belt supported by roller means fixed to a pivoting rail and an upper belt supported by roller means fixed to a lowering rail, blanks being guided between said upper and lower belts and loaded into transport containers in an upright position, in which said lowering rail can be lowered from a position above the container in a generally vertical direction to a point near one of the floor of the transport container and a point near a previously loaded layer of blanks, and the pivoting rail can be pivoted around a point of rotation from a retracted position to a position just above that of a loaded layer of blanks, comprising:

single drive means (**23**) for imparting motion to said lowering rail (**1**) and said pivoting rail (**9**);

a first arm (**2**) coupled to said lowering rail for raising and lowering it;

a second arm (**7**) coupled to said pivoting rail for pivoting it;

an adjustable lost motion mechanism (**26-31**) coupled to said second arm for providing a range of lost motion; and

a connecting rod (**25**) coupling said first arm to said lost motion mechanism, whereby the amount of lost motion between said connecting rod and said second arm may be varied.

4,241,560

APPARATUS FOR FOLDING AND CLOSING THE TOPS OF FOLDING CARTONS

Gerhard Deimel, Opladen, and Paul Schmidt, Dusseldorf, both of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 22,006

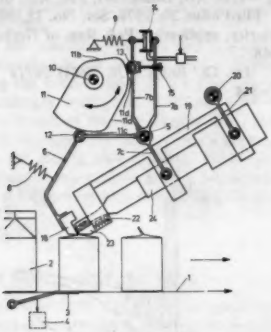
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812138

Int. Cl.³ B65B *7/04, 7/06, 51/22*

U.S. Cl. 53—373 **9 Claims**

1. An apparatus for folding and closing the top of folding cartons prefabricated from cut boxboard stock having an inner thermoplastic-resin liner, comprising means for stepwise conveying the folding cartons in a row, upright, with the fillet seam of the carton perpendicular to the direction of travel, and a single folding, pressing and welding station having ultrasonic

welding means including a vibratable tip and a pressing and welding tool comprising a pair of jaws and the tip, means mounting the jaws for movement toward each other in the manner of tongs wherein one of said jaws includes a folding



wedge and an anvil above said folding wedge, the other jaw being configured as a folding and clamping wedge, and means mounting the jaws and the ultrasonic vibrating means in a common holder for movement into and out of engagement with the fillet seam of each carton on the conveying means.

4,241,561

BAG SUPPORT AND DISPENSING APPARATUS

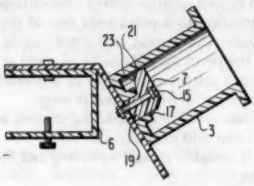
Heikki S. Suominen, 33730 Tampere 73, Finland

Filed Apr. 5, 1979, Ser. No. 27,534

Claims priority, application Finland, Apr. 18, 1978, 781164

Int. Cl.³ B65B *67/04*

U.S. Cl. 53—390 **2 Claims**



1. Apparatus for supporting a stack of bags and maintaining a forwardmost bag in said stack in a loading position, each bag in said stack having an enlarged aperture in the top portion of its forwardmost wall and an aligned smaller aperture in the top portion of its corresponding rear wall, the apparatus comprising:

sleeve means passing through the aligned apertures in said stack of bags to support said bags, said sleeve means including

flange means positioned at the forward end of said sleeve, said flange means dimensioned to readily pass through the enlarged aperture of the front wall and to resist passing through the smaller aperture to retain the rear wall when the front wall is pulled forward to define said loading position, and

collar means positioned at the back end of said sleeve for defining a sleeve support surface extending axially and inwardly within said sleeve; and

support means mounted for detachably engaging at least a portion of said sleeve support surface of said collar means to support said sleeve in a bag dispensing position, said support means including an axially extending shaft portion for contacting said support surface and a radially outwardly extending edge portion for contacting an inner wall of said sleeve to support said sleeve in the bag dispensing position when the sleeve is pressed into engagement with said support means.

4,241,562

METHOD AND APPARATUS FOR AUTOMATIC FILLING OF BAGS

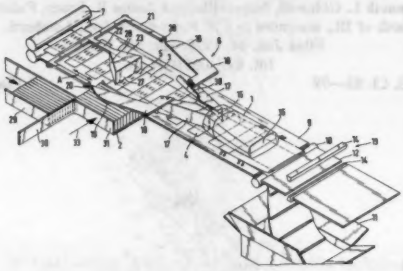
Alfons Meyer, Donauschwabenstrasse 40, D-7050 Waiblingen, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,260

Claims priority, application Fed. Rep. of Germany, May 6, 1978, 2819888; Apr. 3, 1979, 2913224

Int. Cl.³ B65B *63/02, 43/22, 43/36*

U.S. Cl. 53—438 **35 Claims**



1. A method for automatic filling of container bags, said method including supplying empty bags on a carrier web at a scheduled cyclic rate, opening the first bag by means of an opening funnel, placing the goods in the bag and removing the bag from the carrier web and wherein, according to the invention, the method comprises the steps of:

supplying said bags with extending flaps which are permanently attached to the carrier web;

opening the first bag while the bag is attached to the carrier web;

moving the opened bag into a predetermined position with its mouth over the end of the opening funnel so that the opening funnel extends into the bag to spread the mouth thereof and to provide guide surfaces for the fill goods;

holding the bag open;

placing the goods in the bag by means of a moving filling piston; and

causing the separation of said bag from the extending flap along a tear line by pressing the goods against the bottom of the bag, while leaving the flap permanently attached to the carrier web.

4,241,563

APPARATUS FOR PRODUCING AND FILLING TUBULAR BAGS

Werner Müller, Neuhausen am Rheinfall, and Hans Heinzer, Beringen, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Aug. 30, 1979, Ser. No. 70,921

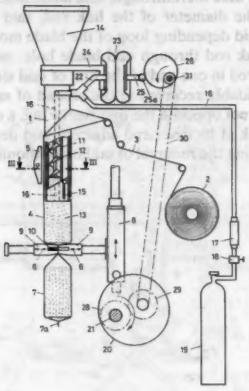
Claims priority, application Switzerland, Sep. 29, 1978, 10152/78

Int. Cl.³ B65B *31/04, 9/08*

U.S. Cl. 53—511 **5 Claims**

1. In an apparatus for producing and filling tubular bags formed of a heat-sealable foil including a shaping pipe about which the foil is wrapped to form a tube, longitudinal heating means adjacent said shaping pipe for producing a longitudinal seam in the tube, removal means, including transverse heating jaws for periodically producing transverse seams in the tube,

for periodically removing a portion of the tube from one end of said shaping pipe to form a bag; filling means, disposed within said shaping pipe, for dispensing the material with which the bags are to be filled into the removed portion of said tube; and means for influencing the pressure in the interior of the portion of said tube being filled, said means for influencing being con-



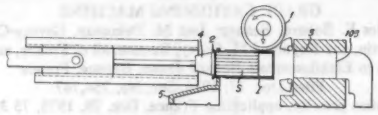
nected via a conduit with the area of said one end of said shaping pipe; the improvement wherein: said means for influencing the pressure comprises a chamber whose volume is variable, and drive means for periodically varying the volume of said chamber in the operating rhythm of said removal means.

4,241,564

CIGARETTE PACKING MACHINES

Rodolfo Quarenghi, Bologna, Italy, assignor to Clr - S.p.A. - Divisione Sasib, Bologna, Italy

Filed Nov. 15, 1978, Ser. No. 960,784
Claims priority, application Italy, Nov. 30, 1977, 12854 A/77
Int. Cl.³ B65B *19/24*
U.S. Cl. 53—575 **6 Claims**



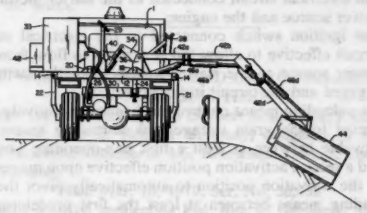
1. A cigarette packing machine of the type where a hollow packet or wrapper presenting an open head side and a closed bottom side is formed around a tubular mandrel or arbor, the packing machine including plunger means for ejecting a group of cigarettes previously inserted at the interior of said arbor in the direction of the closed bottom side of the wrapper, and drive means to reciprocate said plunger means through said arbor, wherein the improvement comprises a slip-off device for slipping the said hollow packet or wrapper off the said arbor concurrently with the displacement of the cigarette group promoted by the said plunger means, and drive means connected for operating said slip-off device synchronously with said plunger drive means so that the cigarette group is maintained out of contact with said closed bottom side of said wrapper during at least a substantial portion of the slipping movement of said wrapper off of said arbor.

4,241,565

BOOM MOWER MOUNTING FRAME FOR OVER CENTER TRANSPORT

Ralph L. Parsons, Jr., 1795 Olmstead Rd., West Jefferson, Ohio 43162

Filed Jun. 4, 1979, Ser. No. 45,241
Int. Cl.³ A01D *35/28*
U.S. Cl. 56—10.7 **9 Claims**



1. In combination, a frame, a mount, and a boom;

said boom having at least one section attached to said mount at one end and capable of retaining a mowing unit about its free end, means pivotally attached to said section and said mount for adjustably rotating said section about its point of attachment to said mount, the axis of said rotation being horizontal,

said mount being pivotally attached to said frame about a first pivot point and having means associated therewith for adjustably pivoting said mount about its pivotal attachment to said frame, the associated means being attached to said mount at a second pivot point, the axis of rotation of said second pivot point being horizontal,

said mount pivoting means being cooperatively operable for adjustably positioning said boom section about said first pivot point to (1) a generally horizontal position extending away from said frame for operation of said mowing unit and (2) over the frame at an angle of greater than 90° from said horizontal position, said mowing unit and said boom being positioned over said frame thereby, and

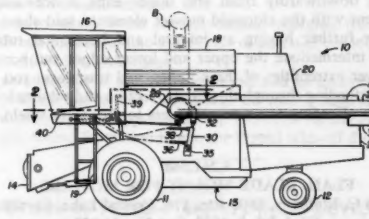
the frame being mounted on a vehicle having at least two axles and said frame being directly connected to one of said axles.

4,241,566

COMBINE UNLOADING AUGER SAFETY SWITCH

E. Graham Webster, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 10, 1979, Ser. No. 73,598
Int. Cl.³ A01D *75/18, 57/00*
U.S. Cl. 56—14.6 **21 Claims**



1. In a harvesting and threshing machine for harvesting crop materials from a field by means of a header attached to a mobile frame cooperably associated with a feeder housing and crop processing means, the crop processing means being in material flow communication via transport means with a grain storage tank, the grain storage tank having an unloading means

pivotally movable between at least a first predetermined position and a second predetermined position, the combination comprising:

(a) an internal combustion engine mounted to the frame to drive the machine across a field;

(b) an electrical power source mounted to the frame;

(c) a starter motor connected to the engine to selectively start the engine;

(d) an electrical circuit connected to the starter motor, the power source and the engine;

(e) an ignition switch connected to the electrical starter circuit effective to allow the electricity to flow from the power source to the starter motor when the switch is engaged and the circuit is closed;

(f) an unloading means control mechanism operatively connected to the grain storage tank unloading means and movable between at least a first non-operating position and a second activation position effective upon movement to the activation position to automatically pivot the unloading means between at least the first predetermined position and the second predetermined position;

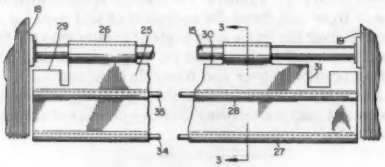
(g) a safety ball switch connected to the electrical circuit and cooperative with the unloading means control mechanism such that when the control mechanism is in the activation position and the engine is not running, the starter circuit is broken preventing the engine from being started when the ignition switch is engaged until the control mechanism is returned to the non-operating position.

4,241,567

LAWN MOWER SAFETY SHIELD

Donald L. Carolan, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 21, 1979, Ser. No. 12,966
Int. Cl.³ A01D *53/00*
U.S. Cl. 56—17.4 **7 Claims**



1. A safety shield for a lawn mower having a transverse axle structure with ground wheels at opposite ends and elements on the mower adjacent the axle structure, said shield being composed of a polymeric sheet-like member having upper and lower horizontal tubular edges, said upper tubular edge receiving the axle structure so as to permit the sheet-like member to swing fore-and-aft, said member further having notches extending downwardly from said upper edge in fore-and-aft alignment with the aforesaid mower elements, said sheet-like member further having an integral and horizontal tubular section intermediate the upper and lower edges and beneath the lower extremities of the notches; and transverse rod elements extending through the tubular section and tubular lower edge for affording transverse stiffness to the safety shield.

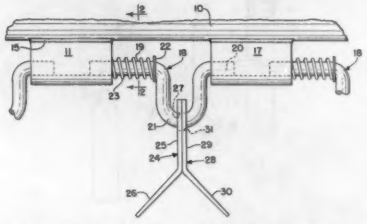
4,241,568

FLAIL BLADE MOUNT FOR MOWERS

Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014

Filed Jul. 5, 1979, Ser. No. 54,835
Int. Cl.³ A01D *55/22*
U.S. Cl. 56—294 **2 Claims**

1. A releasable blade holder for a flail mower having a rotor drum comprising a first U-shaped sleeve lug welded to the surface of the rotor drum, a second U-shaped sleeve lug welded to the surface of the rotor drum in axial alignment with the first of said U-shaped sleeve lugs and with a certain spacing therebetween, a blade mounting link of rod material having a first long shank and a second short shank, said shanks in axial alignment and the overall length of the spaced apart shanks being greater than the certain space between the U-shaped sleeve lugs, said blade mounting link having a depending loop of U-shape between the spaced apart shanks, a blade having a portion with a hole therethrough, said blade hole being greater in size than the diameter of the link rod, said blade loosely received on said depending loop of the blade mounting link by passing the link rod through said blade hole, said long shank slidably received in one end of the first of said sleeve lugs, said short shank slidably received in the second of said sleeve lugs in the end thereof opposite the first sleeve lug, a collar fixed on said long shank at its inner end adjacent said depending loop, means restraining the removal of said blade mounting link from



its engagement with the spaced apart U-shaped sleeve lugs, said means restraining including a coil spring mounted on said long shank having its one end abutting the fixed collar and its other end abutting the first of said sleeve lugs to normally urge said blade mounting link toward the second of said sleeve lugs, and upon compression of the coil spring by manually moving the blade mounting link toward greater engagement of the first of said sleeve lugs by the longer shank the shorter shank becomes disengaged from the second of said sleeve lugs permitting the blade mounting link to be rocked downwardly at that end causing the longer shank to swing up within the first of said U-shaped sleeve lugs for removal of the blade from the depending loop of the blade mounting link or full removal of the blade mounting link from the drum rotor by pulling the link out of the first U-shaped sleeve lug while it is in its rocked down position.

4,241,569

GRAPE GATHERING MACHINE

Charles E. Bobard, Beaune; Just M. Delaunay, Gevrey-Chambertin, and Raymond M. Darcy, Beaune, all of France, assignors to Etablissements Bobard Jeune, Beaune, France

Filed Dec. 27, 1976, Ser. No. 754,747
Claims priority, application France, Dec. 29, 1975, 75 39936
Int. Cl.³ A01G *19/00*
U.S. Cl. 56—330 **39 Claims**

1. A machine adapted for moving along a row of vines and for gathering from vegetation grapes or other types of berries, comprising:

at least one support housing formed with a front and rear generally vertical opening and a bottom opening through which the vegetation is to pass as the machine is moved along the row of vines;

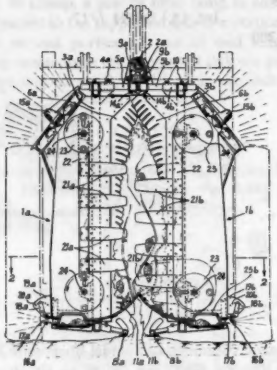
a flexible flap means attached to said support housing to at least partially cover each of said openings to define with said support housing at least a partial enclosure into which the vegetation passes through said flap means;

ventilator means on said support housing for producing an air flow within said enclosure;

at least one comb means carried by a said support housing, said comb means including at least one elongated blade of flexible material which extends in a direction toward the vegetation and which is substantially flexible in the hori-

zontal direction and substantially rigid in a vertical direction,

drive means carried by said support housing for moving the comb means and the blades of each said comb means in a closed-curve path in a generally vertical plane substantially perpendicular to the row of vines and the direction of movement of the machine, into the vegetation, through



the vegetation in a generally vertical direction to sever the vegetation and withdrawing from the vegetation, said blades flexing in the horizontal direction as they engage various parts of the vegetation while the machine is moved along a row of vines, and

collector means carried by said support housing for collecting the severed vegetation.

4,241,570

METHOD AND APPARATUS FOR SEPARATING TWISTED WIRES

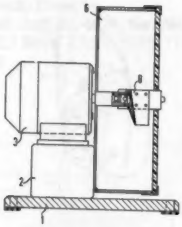
Egon Edinger, Graefelfing, and Zdzislaw Przybylski, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 45,947

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1978, 2833563

Int. Cl.³ D07B *7/18*

U.S. Cl. 57—1 UN **6 Claims**



1. An apparatus for the automatic untwisting of twisted wires having two free ends comprising:

a stationary cylindrical housing;

a drive means having a drive shaft extending axially into said housing;

a wire holder for receiving wires to be untwisted attached to said drive shaft in said housing and co-rotatable therewith;

at least one paddle supported by and extending inwardly from said housing;

a paddle positioner for each paddle having an adjustable portion outside said housing operable to move a paddle from a rest position to an operating position which is in a plane of rotation of said wires in said wire holder; and

a means for adjusting an angle of incidence of said paddle with respect to said plane of rotation,

whereby upon rotation of said wires in said wire holder said free ends momentarily engage at least one paddle during a revolution, thereby inducing oscillations in the wires to untwist the wires.

4,241,571

APPARATUS FOR OPEN-END OR ROUND-ABOUT SPINNING OF A THREAD

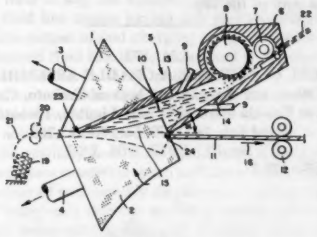
Herbert Turk, Remscheid, and Herbert Schiminski, Hückeswagen, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,035

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1978, 2810843

Int. Cl.³ D01H *1/12*

U.S. Cl. 57—58.89 **18 Claims**



1. In an apparatus for the open-end or round-about spinning of a twisted thread from individual discrete fibers, said apparatus including

two elongated drums, at least one of which is perforated, said drums being arranged to rotate in the same direction and to provide a wedge-shaped nip ending at the common normal plane of said drums to define the narrowest gap which is formed by the respective generatrix lines of the two drums,

air suction means with an opening face located within each perforated drum to produce an air stream entering into each perforated drum and cooperating with said drums to produce a line of thread formation extending longitudinally within said wedge-shaped nip,

a feed channel to supply the individual fibers by means of an air stream directed into said wedge-shaped nip along said line of thread formation, and

means to take off the twisted thread emerging from said thread formation line at one end of said nip, the improvement which comprises:

an arrangement of said two drums and said air suction means with respect to said thread take off means such that the width of the wedge-shaped nip increases on the plane of said thread formation line in the thread take-off direction.

4,241,572

ROTORS OF FREED-FIBER SPINNING DEVICES

Jacques Le Chatelier, Riedisheim, France, assignor to Societe Alsacienne de Constructions Mechaniques de Mulhouse, Mulhouse, France

Filed Mar. 28, 1979, Ser. No. 24,725

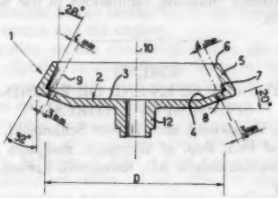
Claims priority, application France, May 9, 1978, 78 13620

Int. Cl.³ D01H *7/888, 7/885*

U.S. Cl. 57—58.89 **3 Claims**

1. A cup-shaped rotor for a freed-fiber spinning device in

which the bottom wall of the cup has a flat central portion surrounded by an inclined annular portion which is raised towards the exterior whilst the lateral wall of said cup has the shape of a cone frustum whose small diameter is located on the edge of the cup opening and the maximum internal diameter of the cup is consequently located between the bottom wall and



the edge of said cup, wherein waste removal holes are formed in the aforesaid annular portion of the bottom wall in the immediate vicinity of the lateral wall of said cup, the axes of said holes having the same angle of slope with respect to the axis of the rotor as the angle of slope of the generator-lines of the lateral wall of the cup.

4,241,573

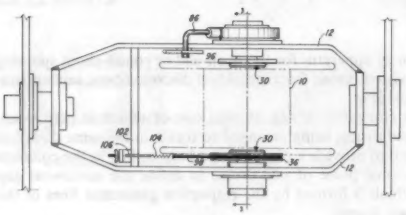
REEL CLAMP FOR A CRADLE ASSEMBLY

Joseph Halasz, and Rokuzo Ito, both of Toronto, Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed Feb. 16, 1979, Ser. No. 12,705

Int. Cl.³ D07B *7/06, 3/02*

U.S. Cl. 57—127.7 **6 Claims**



1. A reel clamp for a cradle assembly having a pair of side frame members comprising:

(a) a first pintle assembly including a first bearing housing, a first reel supporting member rotatably mounted on two axially spaced bearings located within said bearing housing and means for securing said first bearing housing to one of said frame members;

(b) a second pintle assembly mounted in axial alignment with said first pintle assembly and including a second bearing housing, a second reel supporting member rotatably mounted on two axially spaced bearings located within said bearing housing and means for mounting said second bearing housing on the other side frame member; and

(c) cam means associated with said second pintle assembly for moving said second bearing housing back and forth along the axis of said reel for clamping and unclamping said reel between the first and second reel supporting members, said cam means comprising a profiled groove cut in the circumference of the bearing housing of the second pintle assembly over a predetermined length thereof, a cam actuator including a cam roller engaging said groove, and means for rotating said cam actuator around the axis of said second pintle assembly to cause said cam roller to move said second bearing housing axially with respect to the first bearing housing.

4,241,574

SPINNING PROCESS AND APPARATUS

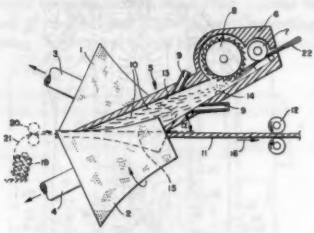
Herbert Turk, Remscheid, and Herbert Schiminski, Hückswagen, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabric AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Jan. 30, 1979, Ser. No. 7,944

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1978, 2803904

Int. Cl.³ D01H *1/12*

U.S. Cl. 57—200 **16 Claims**



1. In a process for spinning individual fibers unto a thread or yarn wherein discrete fibers are fed in an air stream to the narrowest gap which is formed by two air-permeable rollers or drums rotating in the same direction, said discrete fibers are pressed against the roller surfaces by means of air suction devices disposed within the rollers and are twisted together into a thread along a line of rotating thread formation in the region of said narrowest gap by the oppositely moving contact of the roller surface, and the thread is drawn off at one end of the roller surfaces, the improvement which comprises:

directing the air stream feeding the discrete fibers so as to impinge upon the thread formation line at an impingement angle of less than 45° with a vector of movement of said air stream being counter to the thread draw-off direction.

4,241,575

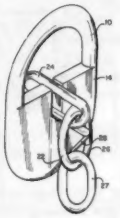
CHAIN SADDLE ASSEMBLY

Dennis St. Germain, Wilmington, Del., assignor to I & I Sling Company, Inc., Aston, Pa.

Filed Sep. 5, 1978, Ser. No. 939,349

Int. Cl.³ B66C *1/12*

U.S. Cl. 59—93 **2 Claims**



1. A chain saddle assembly for adjusting chain lengths and attaching chains used in chain slings comprising:

a ring link used to attach the assembly to a crane hook;

a saddle block, said block being integral with the bottom of said ring link so that a chain may easily be passed therethrough, said block further having a groove therein, said groove having a sufficient width and depth to receive a sideways vertically standing link of the chain and further having a rounded bottom adapted to support the link so that excessive bending moments or tensile stresses are not

introduced into the link when it is loaded, while preventing the chain from slipping.

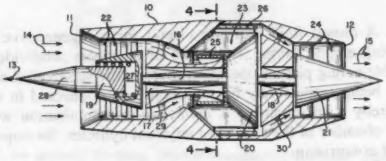
a pair of lateral, right triangular ledges, attached respectively to the opposite sides of said saddle block, the upper surfaces of which are concave indented and adapted to act as extensions of the bottom of said groove to provide additional support for the ends of the supported link said ledges being shaped to receive, and when the chain is loaded, to clamp, a pair of links lying in adjoining sucession adjacent to the supported link in a vertical orientation against an end portion of one of said ledges whereby bending moments in the supported link are prevented and the front and rear ends of the chain are locked in place.

4,241,576

GAS TURBINE ENGINE

David C. Gertz, 5810 Yolanda, Apt. 22, Tarzana, Calif. 91356

Filed Jan. 15, 1979, Ser. No. 3,480
Int. Cl.³ F02C *5/02*
U.S. Cl. 60—39.34 **8 Claims**



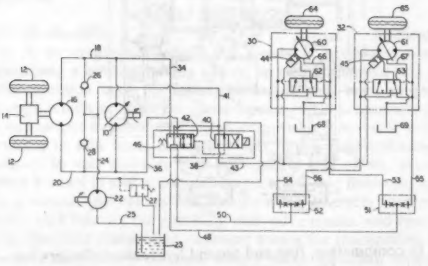
1. A gas turbine engine including a centrifugal fan having radial blades and receiving inlet air through the inner entrance openings to spaces between adjacent blades, said air passing through outer exit openings from said spaces; inner and outer circumferential segments defining closure members for successively eclipsing said inner entrance and outer exit openings when relative rotation between said fan and segments positions said spaces between said closure members to thereby define closed combustion chambers; and means for injecting and igniting fuel into said closed combustion chambers so that constant volume continuous combustion takes place to provide increased efficiency over a Brayton cycle constant pressure type turbine engine.

4,241,577

AUXILIARY DRIVE SYSTEM WITH NEUTRAL

Dale Baldauf, Coldwater, Ohio, assignor to Paul Revere Corporation, Greenwich, Conn.

Filed Aug. 23, 1979, Ser. No. 68,756
Int. Cl.³ B60K *17/34*; F15B *11/06, 13/06*
U.S. Cl. 60—420 **6 Claims**



1. An auxiliary drive system for a vehicle having a variable displacement main pump, a sump for providing a reservoir of hydrostatic fluid, a charging pump for drawing fluids from the sump via a hydrostatic line and delivering said fluids via interconnecting fluid lines to maintain all system components in a fully charged condition, the auxiliary drive system comprising:

a pair of variable displacement type reversible hydraulic auxiliary motors, each of said motors being operably and individually connected to a wheel assembly;

a pair of control pistons for varying the displacement status of said auxiliary motors, each one of said pistons having its rod end mounted for receiving fluid pressure to vary the displacement of each of said auxiliary motors;

first fluid line means connecting the two sides of each of the auxiliary motors with the variable displacement main pump, said fluid lines being arranged so that the auxiliary motors are connected in parallel with each other;

selector valve means having alternate on and off positions for controlling the flow of hydrostatic fluid in said first fluid lines, thereby allowing the auxiliary drive system to be activated or deactivated at will;

a pair of shuttle valves, one in close proximity to each of said variable displacement type reversible motors, each of said shuttle valves being encirculated to maintain said motor in its maximum displacement condition during both forward and reverse actuated states;

pressure compensated flow dividers interposed in said first fluid line means for limiting the maximum flow of hydrostatic fluid to any one auxiliary motor;

second fluid line means having one end in communication with the output of said charging pump, the second end of said second fluid line being connected to supply charging pressure to said auxiliary motors; and

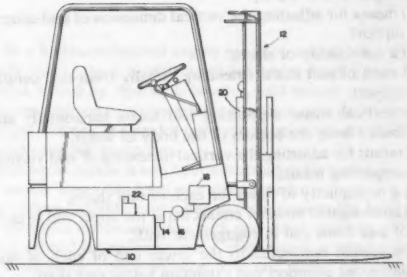
said selector valve means including valve means for controlling fluid flow to said control pistons enabling said pistons to be actuated to either of two states, one state being such that the auxiliary motors are maintained in their maximum displacement condition when said motors are being driven by output of said variable displacement pump, the second state being such that the auxiliary motors are maintained in their minimum displacement condition when said auxiliary motors are in the deactivated condition.

4,241,578

FLUID STORAGE TANK FOR AN INDUSTRIAL VEHICLE

Derek K. Keene, deceased, late of Philadelphia, Pa. (by Judith H. Keene, executrix), assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 18, 1979, Ser. No. 49,520
Int. Cl.³ F15B *1/06, 21/04*
U.S. Cl. 60—478 **3 Claims**



1. In a hydraulic system for an industrial vehicle comprising a fluid storage tank, a pump, a suction line extending into said storage tank and operatively connected to the inlet of said pump, a control valve operatively connected to the outlet of said pump, one or more hydraulically actuated components operatively connected to said control valve, and a return line extending into said storage tank and operatively connected to

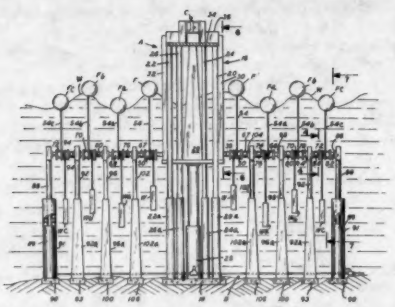
said one or more hydraulically actuated components; the improvement wherein said storage tank includes means defining an upper wall thereof, a surge tank in communication with said storage tank, said surge tank comprising a tubular member having a plate attached to one end to define an upper wall thereof and having the other end attached to said storage tank such that said upper wall defines a lower wall of said surge tank, a first vent tube having one end opening into said surge tank adjacent said upper plate and the other end opening into said storage tank, a second vent tube having one end opening into said surge tank adjacent said upper plate and the other end opening into said storage tank at a point spaced from the point where the first vent tube opens into said storage tank, drain means connected between said surge tank and said storage tank, and means venting said surge tank to atmosphere.

4,241,579

APPARATUS FOR PRODUCING ELECTRICAL ENERGY FROM MULTIDIRECTIONAL WATER WAVE ACTION

Peter M. Borgren, Duluth, Minn., assignor to Hydrodynamic Energy Systems Corporation, Duluth, Minn.

Filed Sep. 14, 1978, Ser. No. 942,339
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—504 **11 Claims**



1. An apparatus for producing electrical energy from multidirectional water wave action comprising:

(a) a central support member having means at the lower end thereof for supporting the same on the bottom of a body of water with the support extending vertically above the surface of the water,

(b) means for adjusting the vertical dimension of said central support,

(c) a multiplicity of shafts,

(d) each of said shafts extending radially from said central support,

(e) vertical means supporting said shafts horizontally and spaced from the bottom of the body of water,

(f) means for adjusting the vertical dimension of said vertical supporting means,

(g) a multiplicity of floats for each of said shafts,

(h) an elongated member connected at the upper end to each of said floats and in engagement with,

(i) a weight connected to the lower end of each of said elongated members and extending below said shaft,

(j) clutch means mounted on each of said shafts and associated with each of said elongated members intermediate the ends thereof adapted to rotate each shaft in one direction when said float raises on a wave and not affect said shafts when said floats lower in a trough between waves,

(k) means connecting each of said shafts with,

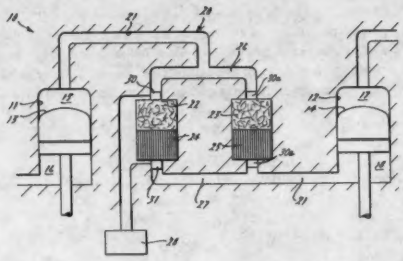
(l) electrical generating means to actuate the same.

4,241,580

STIRLING ENGINE

Ernest W. Kitzner, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 30, 1978, Ser. No. 964,865
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—522 **3 Claims**



1. A closed fluid working circuit for a regenerative type Stirling engine having a plurality of chambers subdivided by double-acting pistons operating therein, the subdivided chambers being respectively hot and cold and connected in series whereby a hot chamber is always in communication with a cold chamber of the next most adjacent cylinder, the improvement comprising:

(a) means defining a plurality of parallel arranged gas flow paths between the respective hot chamber and cold chamber of adjacent cylinders;

(b) regenerator-cooler means disposed in each of said parallel arranged gas flow paths, and

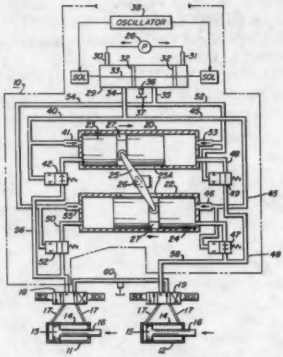
(c) control means for selectively permitting gas flow through one or more of said regenerator-cooling means.

4,241,581

SYNCHRONIZER FOR HYDRAULIC ACTUATORS

Richard A. Chace, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 5, 1978, Ser. No. 966,672
Int. Cl.³ F15B *7/02*
U.S. Cl. 60—538 **7 Claims**



1. In combination, first and second hydraulic cylinders having pistons movable therein, first and second hydraulic actuators, means for supplying hydraulic fluid to said cylinders to drive the pistons back and forth therein, valve means for directing fluid to flow from the first cylinder to the first actuator and from the second cylinder to the second actuator upon

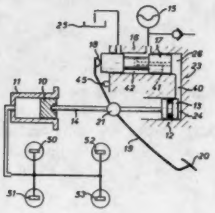
movement of the pistons in one direction and for directing fluid to flow from the first cylinder to the second actuator and from the second cylinder to the first actuator upon movement of the pistons in the opposite direction, and mechanical means interconnecting said pistons for causing said pistons to move simultaneously through equal distances.

4,241,582

ASSISTED BRAKING DEVICE

Jean L. R. Dauvergne, Survilliers, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Oct. 24, 1978, Ser. No. 954,241
Claims priority, application France, Nov. 4, 1977, 77 33168
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—550 **6 Claims**



1. In an assisted braking device comprising a master piston mounted for sliding in a master cylinder, a jack having a piston connected to the master piston by interconnecting means, a source of assisting hydraulic pressure, and a distributor adapted to supply the jack with assisting hydraulic pressure from said source and operated in response to the actuation of a pedal located at one end of a lever which is directly mounted by an articulation on said interconnecting means, the other end of the lever acting on said distributor; the improvement comprising abutment means forming a support for the pedal lever closer to said articulation of said lever on said interconnecting means than said end of said lever acting on the distributor, said abutment means being so positioned that, in the case of breakdown of the assistance system, manual intervention is achieved by abutment of the lever against said abutment means.

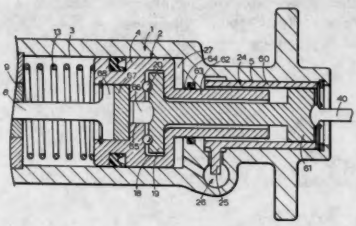
4,241,583

FLUID-PRESSURE OPERATED SERVO-MOTOR ASSEMBLIES FOR VEHICLE BRAKING SYSTEMS

Glyn P. R. Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 799,264, May 23, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,787
Claims priority, application United Kingdom, May 22, 1976, 21286/76
Int. Cl.³ B60T *13/20*
U.S. Cl. 60—555 **8 Claims**

1. A servo-motor assembly for a vehicle braking system comprising a housing having a bore, an output member and a pedal-operated input member working in said bore, means through which an effort from said input member is transmitted to said output member, said means comprising a movable wall working in said bore, means for applying a fluid-operating pressure to said movable wall to augment said effort, valve means located in said housing for controlling said fluid-operating pressure applying means, an operating assembly located within said housing for operating said valve means, said operating assembly comprising abutment means for transmitting a force to said output member, rotary valve actuating means located between said input member and said abutment means, said rotary valve actuating means being angularly movable to operate said valve means and being movable axially with respect to said abutment means through a limited relative distance, said abutment means and said rotary valve actuating means being in the form of pressure plates in adjacent faces of which are provided complementary inclined ramps with a ball co-operating with each pair of ramps in said plates, said ramps and said balls comprising means arranged so that axial movement of said rotary valve actuating means relative to said abutment means forces said balls relatively down said ramps to cause said angular movement of said rotary valve actuating means.

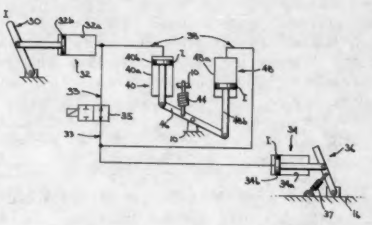


4,241,584

VARIABLE BIASED HYDRAULIC ENGINE SPEED CONTROL

Bruce K. Jaecks, Wauwau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 25, 1979, Ser. No. 60,353
Int. Cl.³ B60T *11/24*
U.S. Cl. 60—580 **4 Claims**



1. In a hydromechanical engine speed control system for a vehicle employing a master controller and a slave hydraulic actuator joined by hydraulic conduit, said master controller being manipulated by an equipment attendant, said slave actuator being coupled to a device regulating engine speed, wherein the improvement comprises:

(a) isolation means in said hydraulic conduit for isolating said master controller from said slave actuator;

(b) a slave hydraulic controller, said slave controller being in hydraulic communication with said slave actuator;

(c) a second hydraulic actuator, said second actuator being in hydraulic communication with said master controller;

(d) linkage means interconnecting said slave hydraulic controller and said second hydraulic actuator to move as a unit; and

(e) biasing means defining a first position for said slave hydraulic controller and said second hydraulic actuator whereby said slave actuator is controlled directly by said master controller when said isolation means is open and said slave actuator is controlled through said slave hy-

draulic controller and said second hydraulic actuator when said isolation means is closed.

4,241,585

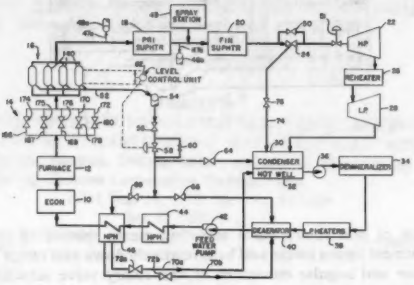
METHOD OF OPERATING A VAPOR GENERATING SYSTEM HAVING INTEGRAL SEPARATORS AND A CONSTANT PRESSURE FURNACE CIRCUITRY

Walter P. Gorzegno, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 14, 1978, Ser. No. 896,524

Int. Cl.³ F01K *13/02*

U.S. Cl. 60—646 **34 Claims**



1. A method of operating a vapor generating system for use in a power plant having turbine control valve means, a steam turbine and a condenser connected in a main flow circuit in a series flow relationship; said method comprising the steps of passing fluid through a vapor generator furnace section at a predetermined percentage of full load flow rate, establishing a firing rate in said furnace section to apply heat to said fluid for converting said fluid to a vapor, separating the vapor portion from the liquid portion of said fluid in said main flow circuit, passing said liquid portion of said fluid in a bypass circuit externally of said main flow circuit, passing said vapor portion through said main flow circuit while increasing said firing rate to a predetermined percentage of full load firing rate and maintaining said predetermined percentage of full load flow rate to increase the throttle pressure of said fluid to said turbine to a value less than a predetermined maximum value, and then increasing said fluid flow rate and said firing rate while controlling said pressure of said fluid exiting from said furnace section in a manner to control the throttle pressure of said fluid to said turbine in proportion to the load demand on said turbine until said throttle pressure attains said predetermined maximum value and the load on said turbine reaches a predetermined percentage of full load.

4,241,586

COMBUSTION CHAMBER OF GAS TURBINE ENGINES

Jacques E. J. Caruel, Maincy; Guy D. Stora, Melun, and Gilles M.-J. B. Schmitt, Cesson la Foret, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d' Aviation, Paris, France

Filed Nov. 28, 1978, Ser. No. 964,427

Claims priority, application France, Nov. 29, 1977, 77 35875

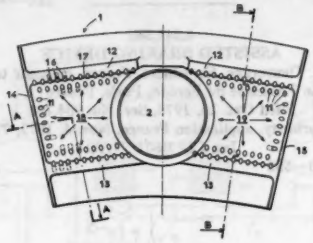
Int. Cl.³ F02C *7/18, 7/22*

U.S. Cl. 60—738 **5 Claims**

1. In a gas turbine combustion chamber having longitudinal side walls, an upstream end wall, at least one transverse shield cup in said chamber adjacent to and spaced from said end wall, partition means defining a plenum chamber between said end wall and shield cups, first passage means for conducting cooling fluid through said end wall into said plenum chamber and second passage means from said plenum chamber through said shield cup, and prevaporized fuel injecting means for directing jets of fuel onto the downstream face of said shield cup, the improvement comprising:

rib means having at least one ridge on the downstream face of said shield cup;

said second passage means comprising small orifices adjacent said rib and arranged to direct first jets of fluid toward said ridge;



said second passage means including orifices from said plenum chamber opening in the region of said ridge and inclined to direct second jets of said fluid in a direction convergent to said first jets.

4,241,587

REFRIGERATING APPARATUS, ESPECIALLY REFRIGERATOR OR FREEZER

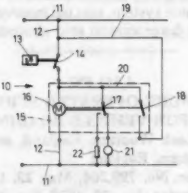
Wolfgang Dienemann, and Rudolf Reichert, both of Giengen, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 965,781

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753744

Int. Cl.³ F25D *21/06*

U.S. Cl. 62—80 **3 Claims**



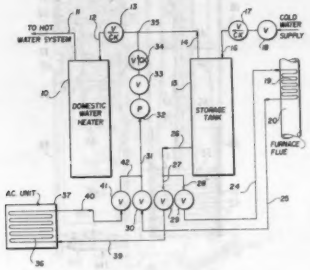
1. Refrigerating apparatus for storing material at and below a permissible upper temperature below the freezing point, such as a refrigerator, freezer and the like with at least one refrigeration chamber, having heat exchanger disposed in the refrigeration chamber, an electrically operated refrigeration unit controlled by a thermostat in the refrigeration chamber which refrigeration unit when energized provides coolant to the heat exchanger to maintain a set temperature of desired coldness in the refrigeration chamber, means for defrosting the heat exchanger, a control device, such as a timer, including switching elements to initiate and terminate defrosting of the heat exchanger, the improvement comprising means for decontrolling the thermostat to prevent it from activating the refrigeration unit prior to every initial defrosting and switch-on means for automatically activating the refrigeration unit prior to every initial defrosting to effect a drop in temperature in the refrigeration chamber sufficient to prevent the stored material from exceeding its permissible upper temperature during subsequent defrosting.

4,241,588

ENERGY CONSERVING WATER HEATING SYSTEM

Jimmy Murphy, Rte. 6, Sunnybelle Acres, Thomasville, Ga. 31792, and Ansley R. Fleetwood, 4206 Lone Oak Rd., Nashville, Tenn. 37215

Filed Apr. 10, 1979, Ser. No. 28,901
Claims priority, application Sweden, Mar. 15, 1978, 7802982
Int. Cl.³ F25B 27/02
U.S. Cl. 62—238 E 2 Claims



1. An energy conserving water heating system comprising a primary water heater having a cold water inlet and a hot water outlet, a water storage tank located upstream from the primary water heater and having a first outlet connected with the inlet of the primary water heater and a second outlet, a furnace flue associated heat exchanger including a water inlet having a connection with the second outlet of said water storage tank and also having an outlet, pump means connected between the last-named outlet and the primary water heater inlet and between such inlet and said first outlet of the water storage tank, another heat exchanger associated with the outlet of an air conditioning condenser and having an inlet connected with the second outlet of the water storage tank and having an outlet connected with the pump means between such means and the outlet of said flue associated heat exchanger, and valve means connected between the second outlet of the water storage tank and the respective inlets of the first and second named heat exchangers and between the outlets of such heat exchangers and the pump means.

4,241,589

HOUSEHOLD REFRIGERATOR AIR FLOW CONTROL ASSEMBLY

Bernard J. Grimm, and Richard A. Dossett, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 30, 1979, Ser. No. 71,206
Int. Cl.³ F25D 23/02, 25/02, 17/04, 11/02
U.S. Cl. 62—265 10 Claims

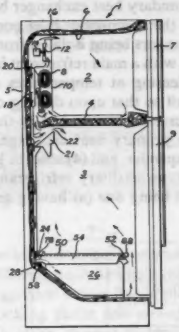
1. In a refrigerator having a freezer compartment on top and a fresh food compartment on the bottom, the two compartments being separated by a partition and interconnected by an air duct located at the rear of the compartments, said air duct having an air inlet opening in the freezer compartment and an air outlet opening in the fresh food compartment, an air flow control assembly comprising:

a movable damper for opening and closing the air duct outlet opening,

a storage pan in the fresh food compartment in air flow communication with the air duct outlet opening,

a stationary cover for the storage pan, and

control means including a movable control mechanism located at the front of the storage pan, a push rod linkage member having means at one end cooperating with the damper to open and close the air duct outlet opening upon movement of the linkage member and the other end having means responsive to movement of the control mechanism for moving the push rod linkage member.

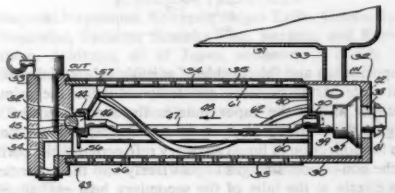


4,241,590

AUGER FLIGHT FOR COMESTIBLE FREEZER

Tom N. Martineau, Kiel, Wis., assignor to Stoelting, Inc., Kiel, Wis.

Filed Jan. 19, 1979, Ser. No. 4,639
Int. Cl.³ A23G 9/00
U.S. Cl. 62—343 9 Claims



9. In a comestible freezer having a freezing barrel with an input end and an output end and a feeder therewithin having an auger ribbon flight helix, the improvement in which the ribbon of the flight helix is skewed with respect to a radial plane through the axis of the helix whereby to exert a radial component of thrust on the comestible and in which the freezer has a fixed blending bar within said helix, said flight ribbon being skewed inwardly toward said blending bar for a portion of its length adjacent the output end whereby to exert a component of thrust on said comestible toward said bar, and in which the freezer has a cold wall, a portion of the flight ribbon adjacent the input end being skewed outwardly toward said cold wall whereby to exert a component of thrust on said comestible toward said cold wall.

4,241,591

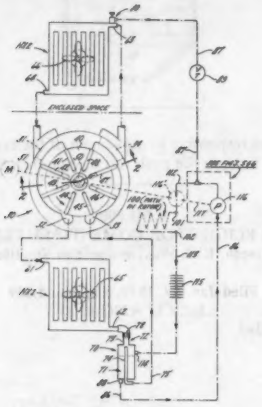
AIR CONDITIONING SYSTEM EMPLOYING DUAL CYCLE

Thomas C. Edwards, Cocoa Beach, Fla., assignor to The Rovac Corporation, Rockledge, Fla.

Filed Jul. 25, 1979, Ser. No. 60,635
Int. Cl.³ F25D 9/00
U.S. Cl. 62—402 25 Claims

1. In an air conditioning system, an air conditioning unit comprising a compressor and an expander, the compressor and expander including a housing having an inner wall defining chamber means with rotor means rotatable therein, the rotor means having vanes for compression and expansion connected

to a common shaft, the compressor and expander each having an inlet port and an outlet port, a primary heat exchanger connected between the compressor outlet port and the expander inlet port, a secondary heat exchanger between the expander outlet port and the compressor inlet port to form a closed loop, the heat exchangers being isolated from one another, the loop being charged with a main refrigerant in the form of a gas which is non-condensing at temperatures and pressures encountered in the unit so that upon driving of the rotor means the gas (1) is compressed and heated in the compressor, (2) releases heat in the primary heat exchanger, (3) is expanded and cooled in the expander, and (4) absorbs heat in the secondary heat exchanger, an auxiliary refrigerant in the loop, the auxiliary refrigerant being one (a) having an appreciable heat



of vaporization and (b) capable of existing substantially in the liquid state at the pressure and temperature in the primary exchanger and in the vapor state in the secondary heat exchanger, the primary heat exchanger having an associated sump for collection of liquid auxiliary refrigerant while permitting the non-condensing gas to pass freely into the expander, a spray nozzle at the inlet of the secondary heat exchanger, a conduit connected to the sump and terminating at the spray nozzle so that liquid auxiliary refrigerant collected in the sump is sprayed into the gas discharged from the expander for vaporization at the secondary heat exchanger for absorption of additional heat therein, the auxiliary refrigerant being present in such excess amount as to collect in the sump to a reliably high level under normal running conditions to insure that auxiliary refrigerant entering the conduit is in liquid form.

4,241,592

CRYOSTAT FOR BOREHOLE SONDE EMPLOYING SEMICONDUCTOR DETECTOR

Ralph M. Tapphorn, Boulder, Colo., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,886

Int. Cl.[2] F25B *19/00*

U.S. Cl. 62—514 R **27 Claims**

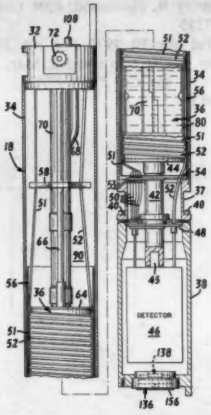
1. A borehole logging tool, comprising:

an elongated logging tool housing sized for passage through a borehole;

a cryostat located within the housing, said cryostat including means defining first and second chambers, said first chamber comprising a generally cylindrical cryogen chamber and forming a reservoir for a cryogenic material and said second chamber surrounding said first chamber and comprising a vacuum thermal insulation chamber;

a semiconductor radiation detector located within said second chamber in thermal contact with said first chamber; and

an active vacuum pump means mounted within said housing and coupled to said second chamber for continuously



maintaining a vacuum therein over the holding time of said cryostat.

4,241,593

ELASTIC SHAFT COUPLING

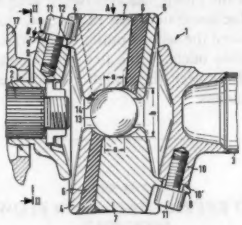
Franz Matyl; Johann Klecker, and Guillermo Sanguino-Alvarez, all of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,106

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705295

Int. Cl.[3] F16D *3/64*

U.S. Cl. 64—14 **14 Claims**



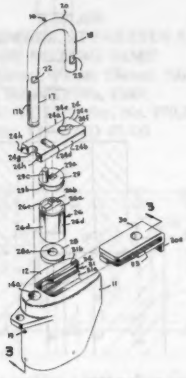
1. An elastic shaft coupling, comprising two coupling means each adapted to be connected with a shaft end under cooperation of respective centering surface means, said two coupling means being non-rotatably connected with each other by interposition of a rubber-elastic layer means, characterized in that the centering surface means of at least one coupling means includes approximately axially directed fastening tongue means substantially uniformly distributed over the circumference, said fastening tongue means being adapted to cooperate with and be threadably connected with a correspondingly directed centering surface means, said correspondingly directed centering surface means being non-rotatable with the respective shaft end, and wherein the fastening tongue means are inclined outwardly with respect to the center longitudinal axis of the shaft coupling by about 15°, and wherein said correspondingly directed centering surface means cooperating with the fastening tongue means is more strongly inclined with respect to the longitudinal center axis than the fastening tongue means.

4,241,594

SLIDE COVER TYPE CHANGEABLE KEY PLUG PADLOCK

Harry C. Miller, Nicholasville, and Walter R. Evans, Lancaster, both of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Sep. 4, 1979, Ser. No. 72,041
Int. Cl.[3] E05B 67/22
U.S. Cl. 70—38 A 18 Claims



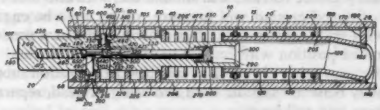
1. A changeable plug exposed shackle padlock comprising a padlock casing having laterally spaced sockets opening through the upper portion thereof adjacent opposite ends of the casing for receiving legs of a shackle and accommodating axial reciprocative movement of the shackle between a lower locking position and an upper release position, a U-shaped shackle including a curved intermediate portion and longer and shorter shackle legs each having locking notches therein, said casing having a central substantially cylindrical plug cavity therein located between said sockets shaped to receive and removably house a key lock plug, a key lock plug removably received in said plug cavity having a lower end including a key passage adjacent a bottom wall portion of the casing for insertion of a key into said key lock plug through a key opening in said bottom wall portion, said casing having an elongated slideway cavity extending along an axis paralleling a center plane through the center axes of said sockets from the space overlying said central plug cavity through one end of the padlock casing outwardly adjacent the socket for the shorter leg, said slideway cavity having a lower slideway portion and having an upper slideway portion bounded laterally by alternating tongue and groove formations, a reciprocatively slidable cover member shaped to complement the upper slideway portion and extend in covering relation over the central plug cavity through the region of the shorter shackle leg and its socket to the adjacent end of the casing, said slidable cover member having alternating tongue and groove formations positioned to interfit with the tongue and groove formation laterally bounding said upper slideway portion and having a cylindrical opening therethrough registering with the socket for the shorter shackle leg when said slide member is fully seated in said slideway cavity in covering relation to said bore, and a slidable bolt plate member guided for longitudinal sliding movement between locking and release positions in said lower slideway portion having parallel sides in sliding abutment with opposite sides of the lower slideway portion and having locking shoulder portions engageable in said locking notches to lock the shackle in said lower locking portion, and bolt driving means for moving the bolt plate member between its locking and release positions upon key operation of the key lock plug.

4,241,595

ROTO LOCK

James Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed May 3, 1979, Ser. No. 35,693
Int. Cl.[3] E05B 35/06
U.S. Cl. 70—347 9 Claims



1. In a lock having a housing, a plurality of locking plates mounted in said housing each having a hole of selected diameter located on a common center line, a plurality of radial slots formed in said locking plates and arranged so as to be misaligned with each other, the improvement comprising a bolt member having:

a fixed transverse pin mounted on said bolt member;

a spring biased movable transverse pin mounted on said bolt member;

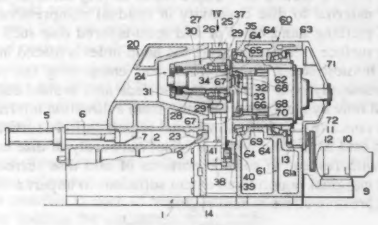
means for retraction such that said movable pin may be retracted in order that said bolt member can be angularly displaced to allow said fixed transverse pin to pass through said plurality of radial slots.

4,241,596

APPARATUS FOR ROLL-FORMING SEAMLESS ANNULAR PRODUCTS

Nobuyoshi Nagatsuma, Kawagoe; Shigeo Kaiho, Omiya; Takashi Nagamine, Saitama; Sousuke Sese, Sayama, and Kunio Kishino, Ashikaga, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 957,111
Claims priority, application Japan, Nov. 4, 1977, 52/132207; Nov. 10, 1977, 52/135048; Nov. 10, 1977, 52/135050; Nov. 17, 1977, 52/138105
Int. Cl.[3] B21B 5/00
U.S. Cl. 72—91 13 Claims



1. An apparatus for roll-forming a blank ring into an annular product, comprising:

a substantially elongated base;

a die head having an annular die rotatably supported therein;

said die head being fixedly mounted on said base;

said annular die being directly driven to rotate by driving means;

a roll head having a pressure roll rotatably supported therein and movable toward and away from said annular die;

said roll head being mounted on said base;

said pressure roll being movable from a position away from said annular die, at which a blank ring may be positioned around said pressure roll, to a position within said annular die;

said annular die including an inner surface which corre-

sponds substantially to an outer peripheral surface of an annular product to be roll-formed;

said pressure roll including an outer surface which corresponds substantially to an inner peripheral surface of said product to be roll-formed;

means for moving said pressure roll radially of said annular die when said pressure roll is positioned in said annular die, whereby said blank ring can be interposed between said pressure roll and said annular die, with said blank ring positioned around said pressure roll so as to be engaged with said inner surface of said annular die at a predetermined position with respect to said annular die; and

said means being disposed on said base in a position substantially between said die head and said roll head, separately from said roll head.

4,241,597

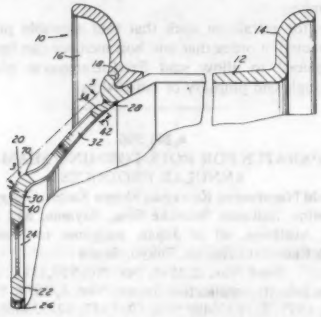
WHEEL DISC MANUFACTURING

John H. Golata, Lansing, and John R. Kinstler, Mason, both of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed May 17, 1978, Ser. No. 906,485

Int. Cl.[2] B21D *31/02*

U.S. Cl. 72—327 **6 Claims**



1. In the method of forming a tapered wheel disc which includes steps of spin-forming an outwardly-tapering concave disc from a section of blanked stock having surfaces internal and external to disc concavity in residual compressive stress and piercing hand holes in said spun-tapered disc such that a disc surface area surrounding the hand holes is placed in residual tension stress, the improvement comprising the step of subsequently cold working said surface area around each said hand hole by embossing said disc from a direction internally of disc concavity to form a marginal region entirely surrounding each said hand hole which is offset outwardly of disc concavity with respect to surface portions of said disc surrounding said marginal region to an extent sufficient to impart a residual compressive stress in said region.

4,241,598

METHOD FOR PRODUCING A CROSS-SLOTTED HEADING DIE

Kurt H. L. Cremer, Ratingen, Fed. Rep. of Germany, assignor to Sack & Kiesselbach Maschinenfabrik GmbH, Duesseldorf

Filed Oct. 16, 1978, Ser. No. 951,633

Int. Cl.[3] B21D *22/00*

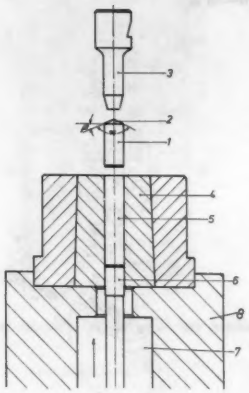
U.S. Cl. 72—354 **2 Claims**

1. A method of producing a cross-slotted heading die for forming cross-slotted screw heads, including the steps of:

preparing a cylindrical blank having a relatively flat cone on one end thereof, said cone presenting an uninterrupted surface and having a cone angle of between 124° and 140°

placing said prepared cylindrical blank within a cylindrical bore having substantially the same diameter as the external diameter of said blank, the lower end of said bore receiving mandrel means, and said blank being placed so that the end thereof opposite to said one end is resting on said mandrel means, and so that the blank is confined over its full height by the sidewall of said cylindrical bore;

inserting a punch into the upper end of said cylindrical bore, said punch having a cross-slotted matrix on the lower end thereof;



pressing said punch downwardly against said cone in a single stage cold forming operation, to deform said cone and fill said cross-slotted matrix whereby to form a desired cross-shaped configuration on said one end of said cylindrical blank;

removing said punch from said bore; and

moving said mandrel means upwardly within said bore, to eject said cylindrical blank therefrom.

4,241,599

METHOD AND APPARATUS FOR THE FORMING OF A SERIES OF TROUGHS INTO A METAL FOIL STRIP

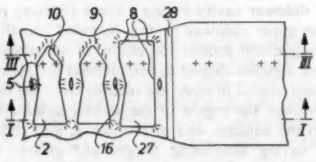
Guenther Kaupert, Thueringer Str. 1, Erndtebrueck, Fed. Rep. of Germany (5927)

Filed Dec. 12, 1977, Ser. No. 859,457

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656758

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—356 **4 Claims**



1. In a method for forming in several stages a series of elongated troughs with cross-sections that vary along the longitudinal extension of the trough into a thin metal strip by means of upper and lower dies which step by step one after the other engage a portion of the metal strip as the metal strip is moved through said stages, said stages consisting of a pre-forming stage in which a trough of larger than final size is formed into the metal strip by pre-forming dies and final forming stages in which portions of the foil material are pleated so as to reduce the size of the trough and bring it into its final form, the improvement comprising first forming a pleat into the metal strip

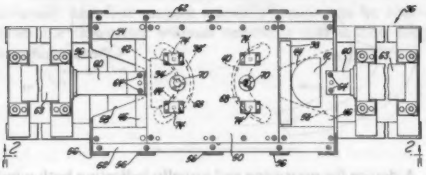
which extends across the strip, i.e. normal to the feed direction of the strip through the stages and which has a depth about equal the greatest depth of the final trough from which pleat a preliminary trough having auxiliary extensions is formed in the pre-forming stage such that the preliminary trough has a larger circumference than the final trough and wherein in at least one final forming stage the foil material defining the extensions is impressed onto the final dies which correspond in form to the final trough.

4,241,600

BRAKE SHOE ASSEMBLY, APPARATUS AND METHOD FOR MAKING SAME

William L. Pringle, Grosse Pointe Shores, Mich., assignor to Leonard Friedman, Beverly Hills, Calif.

Filed Dec. 18, 1978, Ser. No. 970,326
Int. Cl.³ B21D *45/00*
U.S. Cl. 72—411 **6 Claims**



1. An apparatus for making a brake shoe assembly comprising; a bending station for bending a straight length of rectangular bar stock having opposite faces into an arcuate shaped member while maintaining the bar stock substantially flat with the opposite faces extending transversely to the axis of bending, said bending station including a female anvil having a concave arcuate surface and a male anvil having a convex arcuate surface, said anvils being movable relative to one another between an open position for receiving the bar stock and a closed position for bending the bar stock into the arcuate member while moving to said closed position, said bending station including a slide platform and a slide cavity, said slide platform being slidably supported in said slide cavity, said slide cavity having a downwardly facing surface with a recess therein defining said concave surface of said female anvil, said slide platform having an upwardly facing surface for sliding engagement with said downwardly facing surface and a raised portion defining said convex surface of said male anvil, said male and female anvils being horizontally aligned, said slide cavity including a floor portion disposed under said slide platform, said floor portion having an arcuate opening therethrough and disposed beneath the female anvil for allowing the arcuate member to drop therethrough when said slide platform is moved to move said anvils to said open position.

4,241,601

PRE-SET AUTOMATICALLY OPERABLE MEANS FOR MEASURING THE PLASTICITY OF TEST SPECIMENS INCLUDING APPARATUS FOR INDICATING AND RECORDING THE RESULTS THEREOF

Fred A. Pennington, Sr., Naples, Fla.; Fred A. Pennington, Jr., Shiremanstown, and John W. Porr, Jr., New Cumberland, both of Pa., assignors to Andrew S. McCreath & Son, Inc., Harrisburg, Pa.

Filed Feb. 23, 1979, Ser. No. 14,571
Int. Cl.³ G01N *25/04*
U.S. Cl. 73—17 R **10 Claims**

1. A pre-set apparatus for automatically heating and measuring the plasticity of heated specimens of coal and other material and automatically indicating and/or recording the plasticity thereof, said apparatus comprising, in combination,

(a) a plurality of adjacently disposed containers for holding the specimens to be tested;

(b) means for heating the specimens in said containers to heating temperature;

(c) said adjacently disposed heated containers being adapted for successive movement into specimen-testing position;

(d) a vertically extending support including a lateral extension;

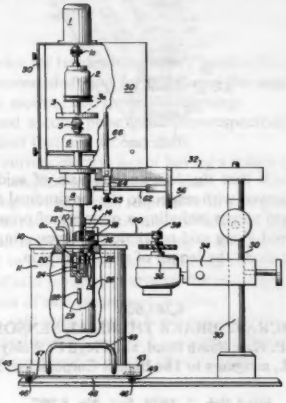
(e) a substantially vertically disposed rotatable stirring rod carried by said support and adapted to extend downwardly into a heated specimen which is in specimen-testing position;

(f) a drive motor carried by said support and adapted to rotate said stirring rod;

(g) a brake connected between said drive motor and said rotatable stirring rod for controlling the amount of torque applied by said drive motor to said stirring rod;

(h) means for measuring movement of the rotatable stirring rod as the test specimen plasticizes;

(i) said last-named means including a rotary optical encoder operatively engaged for rotation with said rotatable stirring rod;



(j) said rotary optical encoder including a rotary member possessing calibrated light-penetrable portions;

(k) a light source for applying light to one side of the calibrated light-penetrable portions of the rotary member of said optical encoder;

(l) said rotary optical encoder including optical sensing means positioned to receive light rays passing through the aforementioned light-penetrable portions of the aforementioned rotary member;

(m) a counter connected to the optical sensing means for recording movement of said stirring rod within a given time reference;

(n) a crucible in each of said adjacently disposed containers for holding the specimens to be tested;

(o) a test specimen within each of said crucibles

(p) means surrounding each of said crucibles for heating the test specimen therewithin;

and

(q) translatory movable means for successively moving each of said containers into position below said stirring rod.

4,241,602

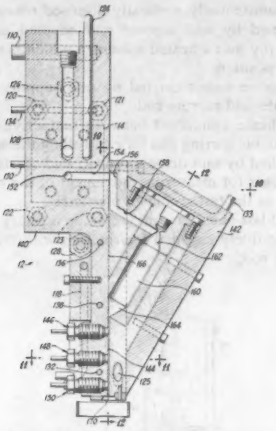
RHEOMETER

Chang D. Han, Nutley, N.J., and Vance Morrow, Tulsa, Okla., assignors to Seismograph Service Corporation, Tulsa, Okla.

Filed Apr. 20, 1979, Ser. No. 31,900
Int. Cl.³ G01N *11/04*
U.S. Cl. 73—56 **20 Claims**

1. Apparatus for measuring the viscosity and elasticity of a fluid comprising, an elongated entrance chamber having a

uniform cross sectional area, an elongated restriction having a constant cross sectional area substantially smaller than the cross sectional area of said entrance chamber, and a transition section coupling said entrance chamber and said restriction, said entrance chamber being disposed with respect to said



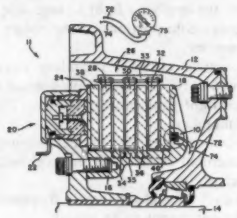
restriction such that the longitudinal axis of said entrance chamber is skewed with respect to the longitudinal axis of said restriction, and means including a plurality of pressure transducers disposed along said restriction for measuring the pressure gradient along the length of said restriction.

4,241,603

AIRCRAFT BRAKE THERMAL SENSOR

Benjamin C. P. Han, South Bend, and Floyd P. Weldy, Bourbon, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 2, 1979, Ser. No. 8,907
Int. Cl.³ G01L *5/28*
U.S. Cl. 73—129 **5 Claims**



1. In a brake, a member to be braked, a backing plate disposed adjacent the member to be braked, a friction pad carried by the backing plate for engagement with the member to be braked, probe means carried by said backing plate for generating a probe signal representing the temperature of the friction pad, the probe means including temperature responsive means for generating the probe signal and heat conducting means for conducting heat from the friction pad to the temperature responsive means;

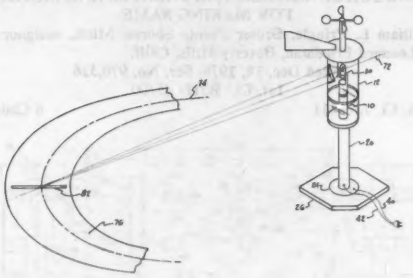
the improvement wherein said probe means includes a housing carried by the backing plate, said housing defining a bore therewithin, said heat conducting means being disposed within said bore, said heat conducting means engaging the friction pad at an open end of said housing, said probe means also including heat insulating means for insulating said heat conducting means from said housing to limit the heat loss from said heat conducting means.

4,241,604

NIGHTTIME WIND DIRECTION AND SPEED INDICATOR

Rudolf C. Hergenrother, Rte. 2, 45 Hidden River La., Sarasota, Fla. 33582

Filed Nov. 13, 1979, Ser. No. 93,883
Int. Cl.³ G01W *1/04*
U.S. Cl. 73—189 **8 Claims**



1. A device for measuring and visually indicating both wind direction and wind speed, comprising:

(a) a lamp positioned in a lamp housing having transparent sides;

(b) a lens for projecting light emitted from said lamp on the surface of a light scattering target external to the device to create a lamp image on said light scattering target;

(c) means for moving said lens in response to changes in wind direction such that said lamp image visually indicates wind direction; and

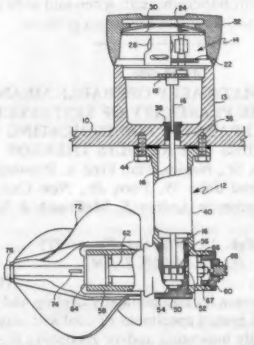
(d) means for flashing said lamp housing and said lamp image at a rate which is responsive to wind speed thereby visually indicating wind speed.

4,241,605

FLOWMETER WITH MAGNETIC COUPLING

Henry L. Hendriks, La Puente, and Avery Hinds, Pomona, both of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Jun. 14, 1979, Ser. No. 48,428
Int. Cl.³ G01F *1/115*
U.S. Cl. 73—861.94 **7 Claims**



1. A fluid flowmeter having a propeller which is rotated by flowing fluid and a counter which indicates the quantity of

fluid which has rotated the propeller, the flowmeter comprising:

a. first magnet assembly means coupled to rotate to drive the counter, said first magnet assembly means including a plurality of magnets located with the locus of their north poles forming a circle and a plurality of magnets with the locus of their south poles located substantially in the same circle;

b. second magnet assembly means coupled to rotate with the propeller, said second magnet assembly means including a plurality of magnets have the locus of their north poles arranged to form a helix and the locus of their south poles arranged to form a second helix spaced apart from the helix formed by the locus of north poles, the second magnet means located so that it magnetically influences the first magnet means and rotation of the second magnet means induces the first magnet means to rotate; and,

c. means disposed between said first and second magnet assemblies to form a liquid-impervious seal therebetween;

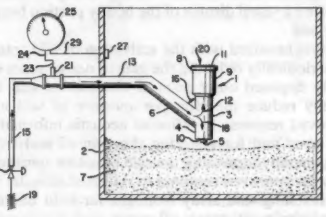
whereby said first magnet assembly means can be removed from the flowmeter without removing said second magnet assembly means.

4,241,606

PARTICULATE LEVEL MEASURING METHOD AND APPARATUS

Jean-Paul Vandenhoeck, 3 Shell Beach Rd., Guilford, Conn. 06437

Filed May 14, 1979, Ser. No. 38,539
Int. Cl.³ G01F *23/14*
U.S. Cl. 73—290 R **16 Claims**



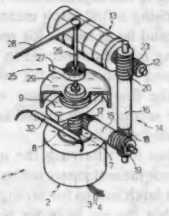
1. Apparatus for continuously measuring the level of particulate material in a container comprising level indication means vertically disposed in said container, said level indication means comprising a conduit having a first end and a second end, said first and second ends including apertures, said first end being vertically disposed above said second end therein such that changes in said level of said particulate material between said first and second ends of said conduit in said container results in corresponding changes in the level of said particulate material in said conduit, means for flowing a gaseous stream through said conduit, and pressure measurement means for measuring the pressure drop in said gaseous stream flowing through said conduit whereby changes in said level of said particulate material between said first and second ends of said conduit causes corresponding changes in said pressure drop, whereby said level of said particulate material between said first and second ends of said conduit can be continuously monitored.

4,241,607

TACHOMETER DEVICE CONTROLLED BY AN ELECTRIC MOTOR

Giorgio Maggia, Arese, Italy, assignor to Fratelli Borletti S.p.A., Milan, Italy

Filed Apr. 16, 1979, Ser. No. 30,271
Claims priority, application Italy, Apr. 21, 1978, 67912 A/78
Int. Cl.³ G01P *3/495, 3/56*
U.S. Cl. 73—490 **12 Claims**



1. A device for transmitting rotary motion from a first shaft and to a second shaft and for measuring the angular speed of said rotary motion, said device comprising:

a first and second pulse generator respectively associated with said first and second shaft,

a direct current electric motor having a rotary output operatively coupled to said second shaft,

processing circuit means responsive to said pulse generators for controlling the activation of said electric motor, and

speed indicator means comprising a permanent magnet secured to said second shaft and means responsive to rotation of said permanent magnet for indicating the speed of rotation of said permanent magnet,

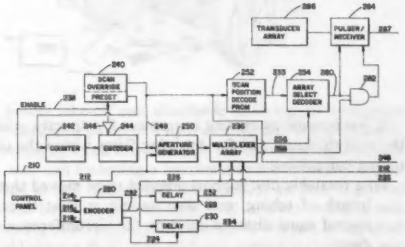
wherein said second pulse generator comprises a magneto-electrical transducer which is actuated by and at predetermined rotational positions of said magnet.

4,241,608

ULTRASONIC SCANNER

Raymond K. Dees, Westminster; Peter J. Van Laanen, and Gregory L. Ream, both of Boulder, all of Colo., assignors to Unirad Corporation, Denver, Colo.

Filed Jan. 24, 1978, Ser. No. 871,785
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—606 **27 Claims**



1. An ultrasonic receiving system comprising:

an array of transducer elements operable in a plurality of groups for receiving echoes from ultrasonic waves, each group producing electrical signals corresponding to the echoes from each of the ultrasonic waves which impinge thereon, wherein the signals from the echoes from each of the ultrasonic waves form one of a plurality of data lines, and each of the groups have a characteristic center posi-

tion relative to an end of the array, whereby each data line corresponds to one of the center positions;

ordering means operably connected with the transducer array for arranging the data lines into a set of data lines in order of increasing distance from said end to the array of the corresponding center position;

interpolator means for averaging adjacent data lines in the set to produce at least one interpolated data line corresponding to a center position between the center positions corresponding to the adjacent data lines; said interpolator means comprising a first latch means for receiving a first data line, second latch means for receiving a second data line, averaging means connected to said first latch means and said second latch means for averaging the data line received in the first latch means with the data line received in the second latch means and producing at least one interpolated data line;

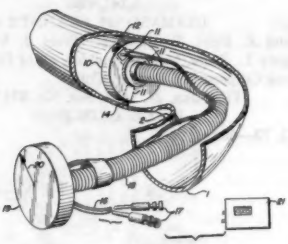
third latch means for receiving the interpolated data line, first multiplexor means connected to said averaging means and said third latch means for arranging each interpolated data line within the set in order between the data lines which were averaged to produce each interpolated data line.

4,241,609

TUBE INTERNAL MEASURING INSTRUMENT

Jack N. Bergman, Munster, Ind., and Bernard Ostrofsky, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 9, 1979, Ser. No. 28,504
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—623 **10 Claims**



1. An internal measuring instrument for directly measuring the wall thickness and for detecting flaws within the walls of tubing comprising:

(a) a rotatable disc support adapted to be moved through a length of tubing, said disc having at least three holes spaced equal distance apart on the circumference of said disc;

(b) at least one laterally movable search unit compressively positioned in at least one of said holes;

(c) laterally movable contact shoes compressively positioned in said remaining holes;

(d) a rotatable handle having a visible indication mark corresponding to the position of said search unit;

(e) a conduit connecting said disc to said handle; and

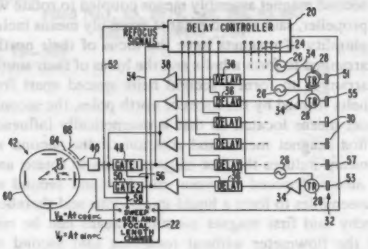
(f) an indicating device electrically connected to said search unit for monitoring measurements.

4,241,610

ULTRASONIC IMAGING SYSTEM UTILIZING DYNAMIC AND PSEUDO-DYNAMIC FOCUSING

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 5, 1979, Ser. No. 9,721
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—626 **16 Claims**



1. In a phased array ultrasonic imaging system of the type comprising:

a linear array of side-by-side transducers adapted for propagating ultrasonic energy into a body to be ultrasonically examined and for receiving reradiated sonic energy from points within said body;

a signal channel connected to each of said transducers, for activating said transducers to propagate said sonic energy, and for receiving electrical signals from said transducers corresponding to said reradiated energy;

delay means in each of said channels for introducing time delays in the electrical signals proceeding in said channels during said transmission and reception;

means controlling said delay means in each of said channels thereby to steer the acoustic beam from said transducer array over a desired azimuthal range to enable scanning of said body;

means for processing the received signals proceeding through said channels, and for combining said signals and effecting a visual display of the bodily portion being examined; and

means synchronized with the activation of said transmitters for periodically reducing the gain of one or more symmetrically disposed outer pairs of elements of said array, to thereby reduce the effective aperture of said array for improved response to reflected acoustic information near said array and for restoring the gain of said transducer pairs, thereby increasing the said effective aperture of said array for improved response to reflected acoustic information reaching said array from the far field of the object being examined;

the improvement comprising:

means for adjusting the focal length of said array coincidental with the said changes of gain of said pair of elements of said array whereby to maintain a desired resolution within a desired focal range.

4,241,611

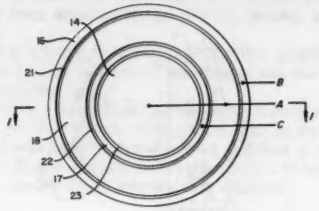
ULTRASONIC DIAGNOSTIC TRANSDUCER ASSEMBLY AND SYSTEM

Donald F. Specht, Los Altos, and Julian Dow, Mountain View, both of Calif., assignors to Smith Kline Instruments, Inc., Sunnyvale, Calif.

Filed Mar. 2, 1979, Ser. No. 16,782
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—626 **4 Claims**

1. An ultrasonic transducer assembly and system including means for transmitting ultrasonic energy into a body to be diagnosed, a disc-shaped transducer element, a first narrow ring-shaped transducer element closely spaced from and sur-

rounding said disc, a second wider ring-shaped transducer element closely spaced from and surrounding said first ring-shaped transducer element, a third ring-shaped transducer element of intermediate width closely spaced from and surrounding said second transducer element, means for focusing said transducer elements, said focused transducer elements serving to receive transmitted ultrasonic energy reflected from



interfaces in said body to be diagnosed and each providing an output electrical signal, means for sequentially receiving the electrical signals from said elements firstly from the first transducer element, secondly from said third transducer element and finally from all transducer elements to thereby provide a dynamically focused system which sequentially receives energy reflected at close range, intermediate range and distant range.

4,241,612

FLOWMETER

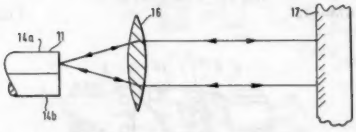
Roger J. Williamson, Harlow, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 17, 1979, Ser. No. 67,548

Claims priority, application United Kingdom, Nov. 23, 1978, 45756/78

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **3 Claims**



1. A flowmeter comprising: a housing; a bluff body mounted in said housing to cause vortex shedding; a converging lens mounted in said housing; a planar mirror mounted in said housing, said mirror being mounted perpendicularly to the optical axis of said lens; means for transmitting light beam from the lens focus such that said light beam, in the absence of fluid vortices, being reflected back to said focus; light detecting means disposed adjacent the lens focus; and a frequency meter coupled to said light detecting means, passage of a fluid vortex between said lens and said mirror defocusing said lens sufficiently to direct light reflected from said mirror to said light detector means.

4,241,613

MASS RATE FLOW METER

Allen C. Bradham, III, Milwaukee, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Jun. 29, 1979, Ser. No. 53,429

Int. Cl.³ G01F *1/78*

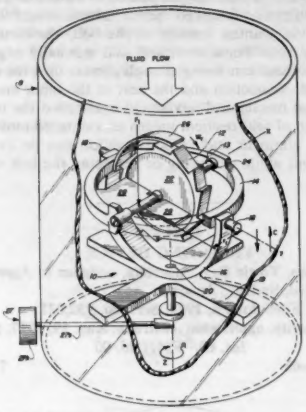
U.S. Cl. 73—861.71 **17 Claims**

1. Apparatus for measuring the mass flow of a fluid in a flow stream comprising:

a gyroscope having an impeller rotor;

means for directing a portion of said flow stream against said impeller to spin said impeller at an angular velocity proportional to the velocity of said flow stream;

means for deriving a force proportional to the momentum of



fluid in said flow stream and applying such force as a precessional force on said gyroscope; and

means for sensing the resulting precessional movement of said gyroscope.

4,241,614

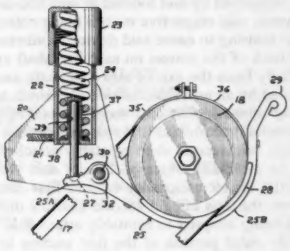
POWER TAKE-OFF

Wayne P. Gould, 1106 Hooksett Rd., Hooksett, N.H. 03106, and Raymond J. Chouinard, 41 Granite St., Suncook, N.H. 03275

Continuation-in-part of Ser. No. 848,510, Nov. 4, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,338

Int. Cl.³ F16H *7/12*

U.S. Cl. 74—15.63 **6 Claims**



1. A power take-off unit attachable to an engine to support a pulley equipped pump of a hydraulic system in a position to be connected by a belt to a pulley on the crankshaft of a vehicle engine, said unit including a bracket attachable to said engine above and at one side of said shaft pulley, an arm, a pivotal connection between said arm and said bracket enabling said arm to swing in a vertical plane normal to the axis of the shaft and establishing a short inner end arm portion including a seat and a substantially longer outer arm portion including a manually engageable end and an intermediate concave seat, means operable to secure said pump to said concave seat with the pump pulley in transverse alignment with the shaft pulley, adjustable resilient means supported by said bracket and including an upwardly extending, adjustably backed coil spring the lower end of which is close to but above the seat in the shorter arm portion and said pivotal connection, a rod entrant of the seat in the shorter arm portion, and a connection be-

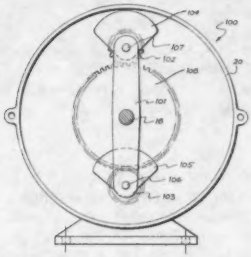
tween said rod and the lower end of said spring transmitting the pressure of said spring to the arm through the rod, said resilient means yieldably opposing movement of said pump towards said shaft pulley from a first position into a second position in which a belt may be placed in trained engagement with both pulleys or removed therefrom and in said first position, providing wanted tension on the belt, the distance between said pivotal connection and said manually engageable end portion of said arm being enough greater than the distance between said connection and the seat of the inner end of the arm such that mechanical advantage is afforded the user that the resistance of said resilient means encountered moving and holding the pump in said second position can be overcome with one hand while removing or replacing the belt with the other hand.

4,241,615

VIBRATING DEVICE

John W. Ryan, Yowie Bay, Australia, assignor to Agrow Plow Pty. Limited, Sydney, Australia

Filed Aug. 8, 1978, Ser. No. 932,021
Claims priority, application Australia, Aug. 19, 1977, PD1307
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—61 **7 Claims**



1. A vibrating apparatus comprising: a housing; a rotatable first shaft supported by and located in said housing; a first and a second mass, said respective masses being rotatable in phase within said housing to cause said device to vibrate, first means mounting each of the masses on said first shaft and being disposed radially from the axis of said first shaft, said first means being defined by an arm fixed to said first shaft, said arm having radially opposite first and second sections, said sections extending radially from said first shaft in opposite directions; a second shaft, said second shaft rotatably attached to said first mass and to a radially outer portion of said second section, whereby, the center of gravity of said first mass is radially spaced from the axis of said second shaft; a third shaft, said third shaft being adapted to rotatably attach said second mass to a radially outer portion of the first section to said second section for permitting the center of gravity of said second mass to be radially spaced from the axis of said third shaft; and second means to rotate said second mass about the axis of said third shaft in phase with said first mass, when said arm is rotated relative to said housing.

4,241,616

TENSIOMETER CAPABLE OF BEING ATTACHED TO A CABLE UNDER TENSION

Max V. Mastrigt, Tarzana, Calif., assignor to W. C. Dillon & Co., Inc., Van Nuys, Calif.

Filed Sep. 11, 1979, Ser. No. 74,341
Int. Cl.[3] G01L *5/04*
U.S. Cl. 73—144 **6 Claims**

1. A tensiometer capable of being attached to a cable under tension, including, in combination:

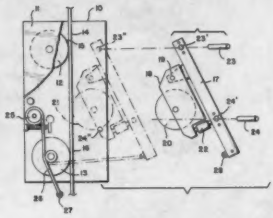
(a) frame means;

(b) first and second tandem cable guides mounted on said frame means for engaging spaced points on one side of said cable;

(c) a central cable guide means;

(d) removable pivot means for pivoting one end portion of said central cable guide means to said frame;

(e) winch means on said frame connected to said central cable guide means for swinging the guide means about its pivoted end portion to bring the central guide means into



engagement with an opposite side of said cable intermediate said spaced points to thereby deflect the cable while under tension; and

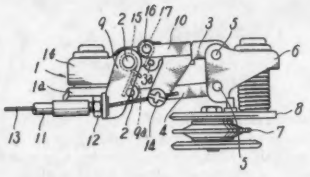
(f) force measuring means carried on said frame means and responsive to the reaction force exerted by said cable on said central guide means when said central guide means has been pivoted to a given position in said frame means so that said force measuring means provides an indication of the tension in said cable.

4,241,617

DERAILLEUR FOR A BICYCLE

Masashi Nagano, and Hideaki Fujimoto, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 4, 1976, Ser. No. 729,015
Claims priority, application Japan, Oct. 13, 1975, 50-123478
Int. Cl.[3] F16H *11/00*
U.S. Cl. 474—82 **7 Claims**



1. A derailleur for a bicycle, which is adapted to change the speed of the bicycle by shifting without spring bias a driving chain to one of two or more sprockets by pushing a push-pull control wire from a large diameter sprocket to a smaller diameter sprocket, said derailleur comprising:

four members including a fitting member, a pair of linkage members, and a movable member;

said linkage members being freely oscillatably supported by said fitting member, said movable member being freely oscillatably supported by said linkage members and having a chain guide means for guiding the driving chain onto one of the sprockets to thereby be shiftable axially of the sprockets with respect to said fitting member;

a first arm pivoted to one of said four members;

a first retainer on one end of said arm for retaining an end portion of one of a control wire or an outer cable therefor so that when the control wire is pushed said arm may pivotally move independently of any shifting of the movable member;

at least one spring for biassing said first arm toward one of said four members, said spring having a biassing force which is greater than a resistive force imparted to said movable member against shifting for changing the speed of the bicycle and less than the force required to buckle the control wire when pushed for changing the speed of the bicycle from a large diameter sprocket to a smaller diameter sprocket and to produce a force greater than the resistive force imparted to said movable member against shifting;

a second arm pivoted to one other of said four members;

a spring for biassing said second arm toward said one other of said members; and

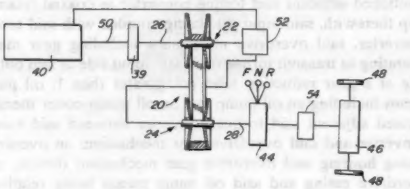
a second retainer on said second arm for retaining an end portion of the other one of the control wire or the outer cable therefor, said second arm being mounted to one of said four members which is movable relative to said one member toward which said first arm is biassed.

4,241,618

VARIABLE PULLEY TRANSMISSION

Richard L. Smirl, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 2, 1979, Ser. No. 16,862
Int. Cl.³ F16H *55/52*
U.S. Cl. 74—863 **12 Claims**



1. In a power transmission apparatus adapted to transmit rotary motion between an engine with an engine shaft and a driven means such as the driving wheels of a vehicle and the like and having a variable rotary pulley drive unit with a driver pulley and a driven pulley connected by a belt means, each pulley having a pair of flanges, at least one flange of which is axially movable with respect to the other flange to change the spacing between the flanges and thus the speed ratio between the pulleys, and means responsive at least to the speed of the engine shaft to change the spacing of the pulley flanges and thus the speed ratio, the improvement which comprises:

means connecting said driver pulley directly to the engine shaft so that the pulleys are continuously rotated only in one direction when the motor is operating and its shaft is rotating, the continuous rotation of said pulleys when said engine is operating enchancing the shifting of the belt means on said pulley flanges when the speed ratio between the pulleys is changed;

means comprising a speed-responsive friction starting device drivingly connecting said driven pulley and said driven means; and

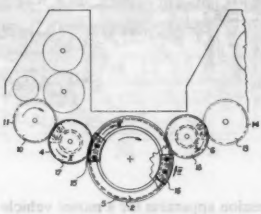
means to select the direction of rotation of said driven means.

4,241,619

DEVICE FOR TAKING UP THE CLEARANCE OF GEAR TRANSMISSIONS

Arnost Cerny, Blansko, and Jaroslav Janecek, Brno, both of Czechoslovakia, assignors to Adamovske Strojirny, Narodni Podnik, Adamov, Czechoslovakia

Filed Apr. 25, 1978, Ser. No. 896,227
Claims priority, application Czechoslovakia, Apr. 13, 1977, 2401-77
Int. Cl.³ F16H *55/18*
U.S. Cl. 74—440 **2 Claims**



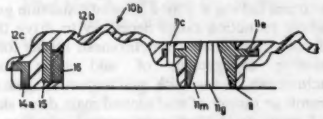
1. A device for taking up backlash between teeth of intermeshing gears comprising at least one arcuate toothed segment, the teeth of which are dimensioned close to those of said gears, said segment teeth having different widths with a reduction of the width of the individual teeth of the segment in the direction from the center part of the segment to the outer portions thereof on both sides, the reduction of the segment tooth width between adjacent teeth having a value in the range of 0.005 to 0.06 mm., and means for securing said segment adjacent one gear so that at least one of the segment teeth aligns with a tooth of said one gear and intermeshes with another of said gears.

4,241,620

BALANCE WHEEL

Heinz Pichl, Uppsala, Sweden, and Günther Kossek, Gechingen, Fed. Rep. of Germany, assignors to AB Volvo Penta, Gothenburg, Sweden

Filed Sep. 20, 1977, Ser. No. 835,037
Claims priority, application Sweden, Sep. 22, 1976, 7610483
Int. Cl.³ G05G *1/00*; H02H *21/12*
U.S. Cl. 74—573 R **17 Claims**



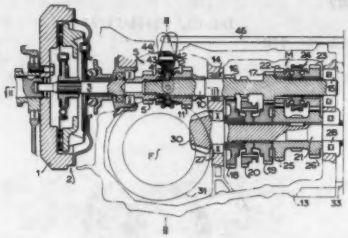
1. A flywheel for an internal combustion engine, comprising a thick peripheral rim portion, a thick central portion and a thin disc portion extending outwardly from said central portion to said rim portion, all said portions being integrally molded of plastic material; a metal hub molded into said central portion; a closed metal ring rigidly molded into said rim portion and extending along the entire periphery thereof; at least one permanent magnet adjacent said ring and extending only along a part of the periphery of the said rim portion, said one magnet being fixed into said rim portion by being embedded therein by shape engagement.

4,241,621

TRANSMISSION APPARATUS FOR MOTOR VEHICLE

Masayuki Kodama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 918,464
Int. Cl.[3] F16H 37/8
U.S. Cl. 74—700 2 Claims



1. A transmission apparatus for a motor vehicle in which an engine having a crankshaft is longitudinally disposed in front of the front axle of the vehicle comprising

a transmission case,

a clutch device coaxially coupled to the crankshaft of the engine,

a first main drive shaft coaxially connected to said clutch device at a right angle to the front axle, an output end of said first main drive shaft being inserted into said transmission case,

a second main drive shaft disposed in said transmission case coaxially to said first main drive shaft,

a sub-transmission means disposed substantially directly above said front axle and for transmitting the output of said first main drive shaft to said second main drive shaft,

said sub-transmission means is disposed in said transmission case substantially directly above said front axle and for transmitting the output of said first main drive shaft to said second main drive shaft,

said sub-transmission means having a 2-speed gear ratio including means having counter gears for reducing the rotational speed of said second main drive shaft relative to said first main drive shaft, and a sub-transmission synchromesh means for selectively coupling the output end of said first main drive shaft and an output end of said sub-transmission means to said second main drive shaft,

a third main drive shaft disposed in said transmission case in parallel with said second main drive shaft,

a main transmission disposed on both of said second and third main drive shafts, said sub-transmission means thereby being operatively disposed in the input side of said main transmission, said main transmission comprising main transmission means including a plurality of reduction gear trains having at least a 3-speed reduction gear ratio in a whole reduction range necessary to drive the vehicle and main transmission synchromesh means for selective operative engagement of said main transmission synchromesh means with said reduction gears so as to transmit an output of said second main drive shaft to said third main drive shaft into several selective rotational speeds, respectively,

a hypoid pinion mounted on an end of said third main drive shaft,

a final reduction gear operatively connected to said front axle and meshed with said hypoid pinion, said final reduction gear being positioned in said transmission case substantially directly beneath said sub-transmission means,

clutch means for providing four wheel for selectively transmitting the output of said third main drive shaft to the rear axle of the motor vehicle,

means for manipulating said clutch means, and

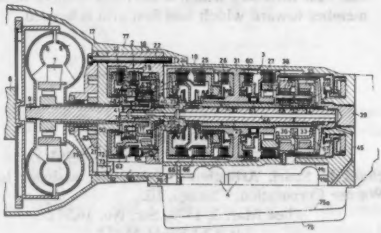
means for manipulating said sub-transmission means, whereby the vehicle may be driven selectively in a lower speed range and in a higher speed range, respectively.

4,241,622

AUTOMATIC TRANSMISSION WITH OVERDRIVE

Seitoku Kubo, Sakae; Kojiro Kuramochi, Aichi, and Hiroshi Ito, Ima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 2, 1977, Ser. No. 847,806
Claims priority, application Japan, Apr. 27, 1977, 52-47874
Int. Cl.[3] F16H 37/00, 57/02
U.S. Cl. 74—740 4 Claims

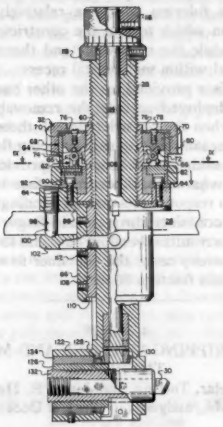


1. An automatic transmission with overdrive comprising a hydrokinetic torque converter including a housing having said torque converter operatively accommodated therein; an overdrive gear mechanism having an input side and an output side positioned adjacent said torque converter in coaxial relationship therewith, said input side being coupled with said torque converter, said overdrive mechanism including gear means operating to transmit torque from said input side to said output side at a gear reduction ratio not greater than 1; oil pump means including an oil pump and an oil pump cover member located adjacent said torque converter between said torque converter and said overdrive gear mechanism; an overdrive casing housing said overdrive gear mechanism therein, said overdrive casing and said oil pump means being relatively positioned such that said oil pump cover serves to house said oil pump and also to simultaneously cooperate with said overdrive casing to form part of the housing for said overdrive gear mechanism; an underdrive gear mechanism positioned adjacent said overdrive gear mechanism on the side thereof opposite said torque converter and arranged in coaxial relationship with said torque converter, said underdrive gear mechanism having an input side and an output side with said input side coupled with said output side of said overdrive gear mechanism, said underdrive gear mechanism including gear means operating to transmit torque from said input side to said output side at a plurality of gear reduction ratios not less than 1; a transmission casing housing said underdrive gear mechanism therein; oil pan means located beneath said underdrive gear mechanism for supplying lubricating oil; oil passage means for transmitting lubricating oil to and from said oil pan means, said oil passage means including an oil exhaust passage defined to extend through a lower portion of said overdrive casing and being in direct flow communication with said oil pan means for returning lubricating oil thereto; an outer peripheral face defined on the exterior of said overdrive casing; and inner peripheral faces defined on each of said transmission casing and said torque converter housing; said transmission being arranged with said overdrive casing mounted partially within both of said torque converter housing and said transmission casing, with said inner peripheral faces of said transmission casing and said torque converter housing each having fitted therein respective portions of said outer face of said overdrive casing.

4,241,623
VERTICAL DRIVE MECHANISM FOR A CUTTING APPARATUS

John F. Wilger, Honolulu; Gregory S. Nakano, Pearl City; Tadao Uyetake, Honolulu; Stephen Orillo, Jr., Wahiawa, and Teikichi Higa, Pearl City, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 861,911, Dec. 19, 1977, Pat. No. 4,175,471. This application Jun. 6, 1979, Ser. No. 45,883
Int. Cl.[3] B23B *41/2;* B23C *1/20;* F16H *1/34*
U.S. Cl. 74—765 8 Claims



1. A vertical drive mechanism for a cutting apparatus wherein the cutting apparatus has a threaded feed shaft which is adapted to be supported for rotation about an axis which is laterally spaced from the longitudinal axis of the feed shaft, said vertical drive mechanism comprising:

nut means threadingly supported on the feed shaft; and

gear means having: a first gear means portion which is fixedly connected to the nut means, a second gear means portion which is fixed in operative engagement with the first gear means portion, and a third gear means portion which is fixed in operative engagement with the second gear means portion; and

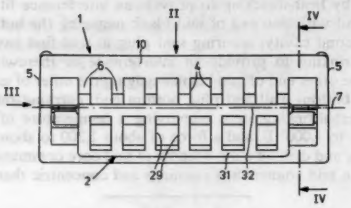
said third gear means portion being mounted rotatably in frictional slidable engagement about said nut means so that the frictional engagement of the third gear means portion about the nut means will cause the third gear means portion to rotate with the nut means, however, upon stopping the rotation of the third gear means portion with respect to the nut means, the nut means will frictionally slidably rotate within the third gear means portion,

and said gear means being operative, upon rotation of the feed shaft and stopping the rotation of the third gear means, to cause the second gear means to rotate which causes the first gear means and nut means fixed thereto to rotate, and which causes the feed shaft during each revolution to feed vertically.

4,241,624
EDGE SHARPENER

Werner Strojny, Marienheide, Fed. Rep. of Germany, assignor to Firma August Rüggeberg, Marienheide, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,132
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1977, 2744521
Int. Cl.[3] B21K *17/00;* B23D *71/06*
U.S. Cl. 76—83 13 Claims



1. An edge sharpener comprising:

a file blade;

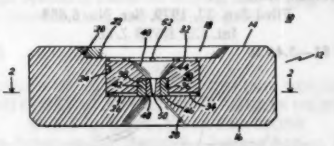
a main body provided with an external guide surface for aligning said body with the surface of an object to be sharpened, and further provided with an internal recess for receiving therein said file blade, said internal recess being defined by at least one contact surface for making area contact with one side of said file blade, a second surface which is inclined with respect to said contact surface and a bottom surface of said main body; and

a rigid clamping wedge, configured to enter said recess via an opening in said main body at least partially for clamping said file blade therein, said clamping wedge having a pressure surface for pressing said file blade toward said contact surface of said main body and further having an inclined wedge surface for pressing against said second surface of said main body which is inclined with respect to said contact surface; and wherein there is further provided in said main body a flexible foil locally fixed to said main body within said internal recess along said bottom surface of said main body opposite said opening and being flexible toward said pressure surface of said clamping wedge, said foil being so disposed as to come to lie between the surface of said file blade remote from said contact surface and the pressure surface of said clamping wedge.

4,241,625
METHOD OF MAKING A WIRE DRAWING DIE

Lawrence W. Corbin, and Charles Carson, both of Ft. Wayne, Ind., assignors to Fort Wayne Wire Die, Inc., Fort Wayne, Ind.

Filed Mar. 8, 1979, Ser. No. 18,649
Int. Cl.[3] B21K *5/20*
U.S. Cl. 76—107 A 8 Claims



1. The method of making a wire drawing die comprising the steps of: providing a metal casing having front and back sides; forming a first cavity in said front casing side having a flat bottom wall and a cylindrical side wall extending from said front casing side to said bottom wall; providing a metal plug having flat top and bottom ends and a cylindrical outer surface

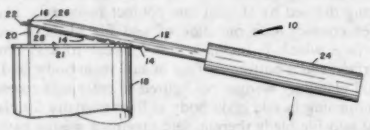
extending between said ends; forming a second cavity in one of said first cavity bottom wall and said plug bottom end, said second cavity having a cylindrical side wall extending to a flat bottom; forming countersunk openings in said top end of said plug and said back side of said casing respectively concentric with said cavities and extending to said bottom of said second cavity and the other of said first cavity bottom wall and said plug bottom end; providing a metal blank having flat opposite ends and a cylindrical outer surface extending between said ends, said blank having a concentric core formed of hard, wear-resistant material; securing said blank in said second cavity by heat-shrinking to provide an interference fit therewith and with one end of said blank engaging the bottom of said second cavity; securing said plug in said first cavity by heat-shrinking to provide an interference fit therewith and with the other end of said blank engaging the other of said first cavity bottom wall and plug bottom end; carrying out both said heat-shrinking steps employing a temperature of about 600° F. to 1,000° F. and a force of about 1,200 to about 2,400 pounds; and drilling a die opening in said core communicating between said countersunk openings and concentric therewith.

4,241,626

OPENER DEVICE FOR SEALED CANS

Frederick M. Hall, P.O. Box 494, Pasadena, Md. 21122

Filed Jan. 4, 1979, Ser. No. 1,010
Int. Cl.³ B67B 7/00
U.S. Cl. 81—3.46 R **7 Claims**



1. An opening device for pull-tab sealed containers, comprising:

a rod-like member, said rod-like member having a plurality of spaced grooved notches thereon, the first one of said plurality of spaced grooved notches being on one side of and near the end of said rod-like member to insert into said pull tab, and the balance of said plurality of spaced grooved notches being located on said rod-like member 180° around and spaced apart from first said grooved notch, said balance of said plurality of grooved notches being spaced apart from each other along said rod-like member to individually rest upon edge of said pull-tab container; and

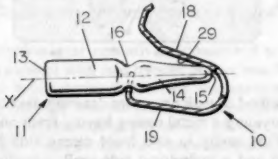
a handle means, said handle means being attached to said rod-like member on the end opposite to the end having said grooved notches.

4,241,627

HAND TOOL FOR OPENING AMPULS

Thomas G. Snow, Vineland, N.J., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 22, 1979, Ser. No. 5,655
Int. Cl.³ B67B 7/00
U.S. Cl. 81—3.46 R **8 Claims**



1. A hand tool for use in providing protective manual assistance in opening frangible hermetically sealed ampuls or like containers having an elongate main body portion and an axially projecting removable end integrally merging with said main body portion through a peripherally constricted neck providing a relatively weakened peripheral fracture zone for accommodating fracturable removal of said removable end in response to a manually applied bending force, said hand tool comprising an essentially rigid one-piece body structure including:

a pair of elongate protective finger grips arranged in side-by-side relationship and having interspaced forward end portions and merging rearward end portions providing a bight section, said finger grips together with said bight section cooperating to define a generally U-shaped central recess therewithin in which to insertably accommodate the removable end of said container;

means on the forward end portion of one of said finger grips providing a fulcrum having a relatively narrow edge surface upon which to seat the constricted neck of said container while the removable end thereof is being accommodated within said central recess;

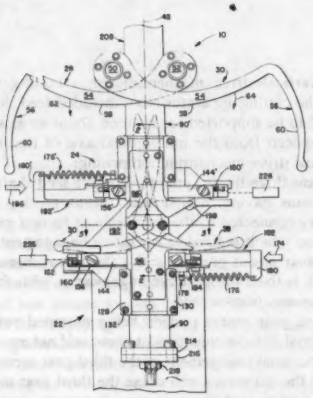
a bearing surface provided on the other one of said finger grips and deployed to face the removable end of said container when the constricted neck thereof is seated on said fulcrum, said bearing surface being flared outwardly relative to said central recess to provide a protective finger stop, whereby said bearing surface and said fulcrum cooperate in response to a manual bending force transmitted to said container through said finger grips to selectively exert a resultant bending momemt to the constricted neck and thereby cause the container to selectively fracture along said fracture zone.

4,241,628

WIRE STRIPPING MACHINE AND METHOD THEREFOR

William F. Sindelar, Towson, and James R. Hetmanski, Perry Hall, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 25, 1979, Ser. No. 51,644
Int. Cl.³ H02G 1/12
U.S. Cl. 81—9.51 **35 Claims**



1. An apparatus for simultaneously stripping the insulation from the ends of a plurality of insulated wires comprising:

insulation stripping means including first and second wire contact surfaces and an insulation cutting means associated with at least one of said wire contact surfaces, said wire contact surfaces adapted to contact the sides of a plurality of insulated wires and restrain the wires therebetween in a wire stripping zone and said insulation cutting means adapted to at least partially penetrate the insulation

on a side of the restrained wires, said insulation cutting means being at least partially co-extensive with its respective wire contact surface;

wire separating means including first and second wire separating elements associated, respectively, with said first and said second wire contact surfaces for separating a plurality of wires so that they lie laterally adjacent one another;

support means for supporting said insulation stripping means and for supporting said wire separating means such that said first wire contact surface and its associated first separating element and said second wire contact surface and its associated second separating element are movable relative to each other to and from a closed, operative position in which said wire separating means is effective to separate a plurality of insulated wires so that they lie laterally adjacent one another and said wire contact surfaces are effective to contact and restrain the wires therebetween in said wire stripping zone and said insulation cutting means is effective to at least partially penetrate the insulation on at least one side of the wires, said support means also supporting at least one of said wire contact surfaces for movement relative to the other wire contact surface to cause the restrained wires to rotate thereby causing said insulation cutting means to at least partially peripherally cut the insulation of the wires;

first drive means for moving said first wire contact surface and first wire separating element and said second wire contact surface and said second wire separating element to said closed, operative position;

second drive means for moving at least one of said wire contact surfaces relative to the other to rotate the wires and cause said insulation cutting means to at least partially peripherally cut the insulation of the wires; and

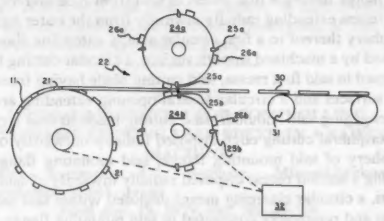
third drive means for separating, in a direction axially of the wires, the wires and the closed wire contact surfaces to remove the peripherally cut insulation from the wires.

4,241,629

APPARATUS FOR SHEARING AND SEPARATING BATTERY GRIDS

Jerry T. McDowell, Greeneville, Tenn., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 10, 1978, Ser. No. 949,938
Int. Cl.[3] B23D *25/12*; B26D *1/56*
U.S. Cl. 83—343 **3 Claims**



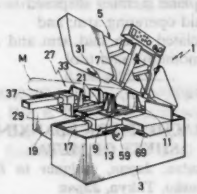
1. An apparatus for forming individual battery grid structures from a sheet material comprising first means for feeding said sheet material in a continuous manner, said sheet having a plurality of voids situated thereon, said first means being provided with engaging members in register with said voids, second means positioned on opposite sides of said sheet material and capable of contacting each other for cutting transversely of said sheet material along a shear line from the edge to a void of said sheet material, third means associated with said second means and positioned on opposite sides of said sheet material and capable of contacting each other for cutting longitudinally of said sheet material along a slit line between adjacent voids, the transversely cutting means being staggered and extending inwardly from the edge to almost the center of the drum, said longitudinally cutting means situated proximate the center of the drum and spaced from and at right angle to every other transversely cutting means, and drive means connected to said first, second and third means, said drive means so constructed to actuate said second and third means in proper relation to the voids on said sheet material such that individual grid structures are separated one from the other from said sheet material.

4,241,630

VISING AND FEEDING APPARATUS FOR CUTTING MACHINES

Kikuo Moriya, Machida, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Apr. 5, 1979, Ser. No. 27,264
Int. Cl.[3] B23D *55/04*
U.S. Cl. 83—409 **8 Claims**



1. A cutting machine for subdividing material lengths, comprising:

a roller table for supporting the material for movement along a transport path to a cutting zone;

a cutting head assembly having a cutting blade for cutting material located at said cutting zone;

a front vise assembly fixed adjacent to the cutting zone, said front vise assembly having first and second jaws arranged in opposed mutually spaced relationship on opposite sides of said transport path, with first jaw operating means for adjusting the spacing of said first and second jaws between an open position permitting movement therebetween of said material and a closed position clamping said material therebetween;

a carriage underlying said roller table, said carriage being configured for movement independently of said roller table and any material length supported thereon in opposite directions parallel to said transport path,

a rear vise assembly mounted on said carriage for movement therewith, said rear vise assembly having third and fourth jaws arranged in opposed mutually spaced relationship on opposite sides of said transport path, with second jaw operating means carried on said carriage for adjusting the spacing of said third and fourth jaws between an open position permitting the aforesaid movement of said carriage relative to said material and a closed position clamping said material therebetween and establishing a fixed relationship between said material and said carriage; and,

carriage operating means for moving said carriage in opposite direction along said transport path.

4,241,631

MACHINE FOR PUNCHING, NIBBLING, ROUNDING OFF AND CUTTING ANY KIND OF SHEETS OR PLATES, AND FOR SIMILAR OPERATIONS

Costanzo Salvatore, Via Meucci 9, Gaggiano (Milan), Italy

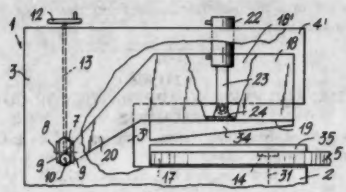
Filed Apr. 2, 1979, Ser. No. 26,000
Int. Cl.[3] B26D *7/26*
U.S. Cl. 83—411 R **9 Claims**

1. An apparatus for matching a workpiece with a tool, said apparatus comprising:

(a) an operating arm;

(b) a pair of parallel vertical supports;

(c) means for pivoting said operating arm on said supports, said pivoting means including means defining elongated slots, a pin disposed in said slots and means for differentially positioning said pin along said slots;



(d) a working plane member disposed in confronting relationship to said operating arm; and

(e) means associated with said arm and said member for temporarily mounting said tool.

4,241,632

BLANKING MACHINE FOR BLANKING HOLES IN SHEET OF METAL

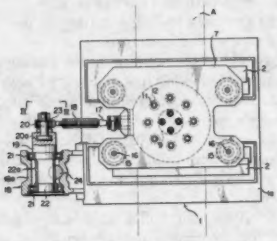
Osamu Seo, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 10, 1979, Ser. No. 56,288

Claims priority, application Japan, Jul. 10, 1978, 53-82949

Int. Cl.³ B26D *5/04*

U.S. Cl. 83—560 **4 Claims**



1. A blanking machine for blanking holes in a sheet of metal, comprising:

a bolster;

a pair of rails fixedly secured to said bolster; said rails extending in a direction right angles to the feeding direction of the sheet of metal to be blanked;

a lower die set slidably mounted on said rails;

a die fixedly secured to said lower die set;

an upper die set having a punch mounted thereon opposite said die;

coupling means for coupling said upper die set with said lower die set allowing said upper die set to move on said rails together with said lower die set;

hydraulic cylinder means having a plurality of pressure chambers formed therein defined by a cylinder barrel and partition walls, the length of said pressure chambers being different from one another, each pressure chamber having mounted therein a piston and a piston rod, and each partition wall and rod-end of said cylinder barrel having holes formed therein allowing the piston rods to slide therein, each piston rod except the last one being adapted to contact with the adjacent piston;

connecting rod means connected to said lower or upper die set at one end thereof; and

transmission means connected to the other end of said connecting rod means at one end thereof, the other end of which is connected to said last piston rod whereby said lower and upper die sets are moved on said rails by the actuation of said hydraulic cylinder means.

4,241,633

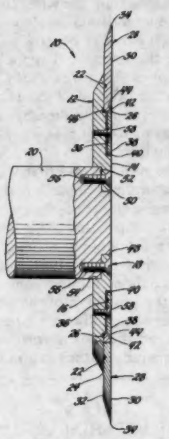
TRIMMER BLADE

Charles G. De Luca, 8412 E. 24th St., Tucson, Ariz. 85713

Filed Mar. 9, 1979, Ser. No. 18,990

Int. Cl.³ B23D *35/00*

U.S. Cl. 83—676 **6 Claims**



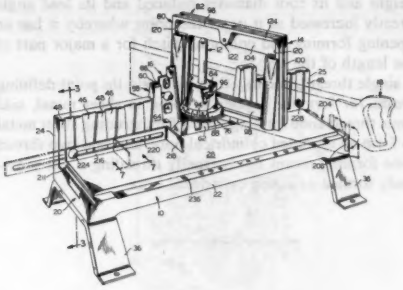
1. A rotary cutting tool assembly comprising; a circular mounting flange having front and rear faces and a central mounting portion for attaching the flange to a support shaft, said flange having a first recess in said front face thereof, said first recess extending radially inwardly from the outer circular periphery thereof to a first circular axially extending shoulder defined by a machined smooth surface, a circular cutting blade disposed in said first recess, said cutting blade having front and rear surfaces and a circular central opening extending around and engaging said shoulder, said cutting blade having a circular peripheral cutting edge disposed radially outwardly of the periphery of said mounting flange, said mounting flange including a second recess disposed radially inwardly of said first recess, a circular clamping means disposed within said second recess and removably connected to said mounting flange radially inwardly of said cutting blade for clamping said cutting blade to said mounting flange, said clamping means including a clamping ring having an inner circular opening and an outer circular periphery disposed in overlapping relationship with the inner circular periphery of said central opening in said cutting blade, said clamping ring and said cutting blade having mating conical surfaces at the overlapping portions thereof, said clamping ring having a rear surface spaced from the bottom of said second recess for clamping the rear surface of said cutting blade tightly against the bottom of said first recess, and wherein said first recess is deeper than said second recess and said second recess extends radially inwardly to a second axially extending shoulder, said second shoulder extends from the bottom of said second recess to said front face of said mounting flange, said inner circular opening of said clamping ring is at least in part spaced from said second shoulder.

4,241,634

MITRE BOX

E. Curtis Ambler, Newington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed May 29, 1979, Ser. No. 42,904
Int. Cl.³ B27G *5/02*
U.S. Cl. 83—763 **17 Claims**



1. In a miter box, the combination comprising:

A. a base member having a horizontal bed surface;

B. a vertical post on said base member extending above said bed surface;

C. a saw guide subassembly rotatably supported on said post, said saw guide subassembly including an index guide segment of arcuate cross section with a multiplicity of indents spaced about the periphery thereof;

D. a wedge member pivoted adjacent its lower end on said base member below said guide segment and spaced horizontally from said post, said wedge member including an engagement edge portion spaced towards its free upper end from its pivot and towards said guide segment, said edge portion being engageable in said indents of said guide segment to prevent rotation of said saw guide subassembly about said post;

E. means biasing said wedge member against said guide segment to engage said edge portion in one of said indents; and

F. positioning means on said base member to orient said engagement edge portion of said wedge member in axial alignment with said post and thereby to ensure substantially accurate and stable rotated positioning of said saw guide subassembly about said post.

4,241,635

HYDRAULIC SYSTEM FOR CONTROLLING SAW-FRAME CUTTING FEED SPEED IN A SAWING MACHINE

Tadahiro Sugimoto, 6-8, 4-chome, Minami-Mukonoso, Amagasaki-shi 661, Japan

Filed Apr. 13, 1979, Ser. No. 29,739
Int. Cl.³ B23D *53/04*
U.S. Cl. 83—800 **2 Claims**

1. A hydraulic system for controlling the cutting feed speed of a saw frame of a sawing machine, said system including:

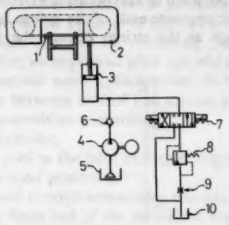
a hydraulic cylinder including a ram supporting said saw frame;

a discharge line allowing the fluid in said hydraulic cylinder to draw off therefrom, said discharge line including a control valve and a throttle valve;

said control valve comprising a spool reciprocally moving under the urge of a first hydraulic pressure and a second hydraulic pressure exerting on its first end face and second end face;

said first end face having a larger pressure receiving area than that of said second end face;

a spring means backing up said spool at its second end face so as to assist the urge of said second hydraulic pressure exerting on said second end face of spool, thereby amplifying variations in pressure in the hydraulic cylinder due to



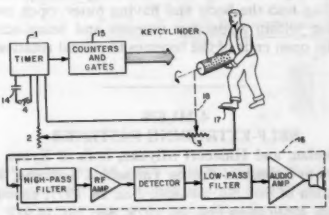
changes of cutting resistance to the saw blade to carry out a sensitive control of the cutting feed speed of the saw frame.

4,241,636

ELECTRONIC MUSICAL INSTRUMENT

Christopher Long, Rte. 6, Box 856, Tallahassee, Fla. 32301

Filed Dec. 28, 1978, Ser. No. 973,855
Int. Cl.³ G10H *1/18, 1/42*
U.S. Cl. 84—1.01 **14 Claims**



1. An electronic musical instrument which produces justly intoned pitches and is capable of changing at will during performance the basis pitch or key signature being played, comprising, means for producing a train of electrical pulses, means for selectively varying at the will of the operator the interval between said pulses, means for converting said train of pulses to a number of pulse trains which are related in frequency by ratios of small integers to produce justly intoned intervals and which ratios are maintained unchanged regardless of the frequencies of said pulse trains, a speaker, a systems of circuits for energizing said speaker which includes a multiplicity of conductive contacts each of which is connected respectively to the corresponding one of the pulse trains of said number of pulse trains, the circuits including each respectively of said multiplicity of conductive contacts being adapted to be selectively closed by the operator whereby the operator by closing selected ones of said conductive contacts and selectively varying the interval between the pulses of said train of pulses may control the resulting sound produced by the speaker.

4,241,637

STRINGED MUSICAL INSTRUMENTS OF GUITAR TYPE

Rachael E. Brent, P.O. Box 884, San Bruno, Calif. 94066

Filed Jul. 3, 1979, Ser. No. 54,472
Int. Cl.³ G10D *1/08, 3/14;* G10H *3/18*
U.S. Cl. 84—1.16 **7 Claims**

1. In a guitar: a body having a pair of opposed extremities and a bridge thereon between said extremities; an elongated neck extending outwardly from one extremity of the body, the outer end of the neck having means for anchoring first ends of a plurality of strings in fixed positions thereon, the strings

adapted to extend from said outer end of the neck along the neck past said one extremity and the bridge to respective locations adjacent to the opposite extremity of the body; means carried by the body adjacent to said opposite extremity thereof and coupled with the opposite ends of the strings for applying tension to the strings as the strings engage the bridge, the

tension applying means including a shaft for each string, respectively, each shaft having a knob on the outer end thereof, the body having a recess for each knob, respectively, the recesses extending into the body and having outer, open ends, the knobs being within respective recesses and being accessible through the open ends of the recesses to permit rotation of the shafts.

4,241,638

SELF-EXTRUDING FASTENER

Mituo Shimizu, and Hidenori Miyake, both of Kyoto, Japan, assignors to Kabushiki Kaisha Yamashina Seikosho, Japan

Continuation of Ser. No. 806,450, Jun. 14, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 14,919
Claims priority, application Japan, Feb. 23, 1977, 52-18048
Int. Cl.³ F16B *25/00*
U.S. Cl. 85—46 **3 Claims**

1. An integral self-extruding screw, comprising,

a cylindrical shank having at one end means for engaging a rotary driving tool and the other merging into a substantially straight tapering tip ending in a point,

the shank having formed on its outer surface a pair of spaced-apart tapping screw threads of the same outside diameter, root diameter and tapping pitch and defining a two thread zone,

each tapping screw thread continuing from the shank for a minor part of the length of the tip with its height gradually reducing just beyond the zone of merger of the shank and tip until both screw threads disappear at substantially opposed places on said tip,

a single opening forming and enlarging thread being generated in a position midway between said tapping threads substantially within said merger zone of the shank and tip to form a three thread zone and continuing on said tip to the point to form a single thread zone,

said opening forming and enlarging thread first having a tapping pitch the same as that of said tapping threads while it intervenes said tapping threads for a minor part of the length of the tip and gradually increasing in height and then as it extends beyond said tapping threads having its height and its root diameter reduced and its lead angle greatly increased as it nears the point whereby it has an opening forming and enlarging pitch for a major part of the length of the tip,

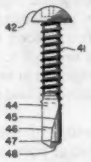
said single thread zone together with said tip point defining means for forming a guide opening in sheet metal, said three thread zone forming means for extruding sheet metal to form an extruded cylindrical bore, and said two thread zone forming means for internally threading a just previously formed extruded cylindrical bore.

4,241,639

METHOD AND APPARATUS FOR PRODUCING DRILL SCREWS

Martin A. Baer, Niles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 851,238, Nov. 14, 1977, Pat. No. 4,138,754. This application Oct. 13, 1978, Ser. No. 950,950
Int. Cl.³ F16B *25/00*
U.S. Cl. 85—47 **2 Claims**

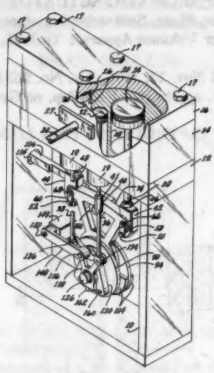


1. A self-drilling screw comprising an elongated shank, an enlarged head at one end with means cooperable with a tool for turning the screw, the elongated shank including a threaded portion intermediate the enlarged head and the entering end portion of the shank, a drill tip formed on said entering end portion including a pair of oppositely disposed, generally longitudinally directed flute means extending upwardly from and intersecting a pair of flat bevel surfaces formed on either side of a terminal ridge edge which intersects and is substantially perpendicular to the longitudinal axis of the shank, each of said flute means comprising first and second intersecting, substantially longitudinally extending surfaces, said surfaces intersecting both of the bevel surfaces with the major lateral extent of said first surface extending at an angle not greater than 45° to the terminal ridge edge and thereby forming laterally extending cutting edges, said first surfaces comprising a pair of intersecting flat surfaces linear in both longitudinal and lateral directions, both of the pair of intersecting flat surfaces being inclined to the longitudinal axis of the fastener with the lowermost of said surfaces being inclined to a lesser amount than the uppermost of said surfaces, said second surfaces comprising a pair of intersecting surfaces, arcuate in the longitudinal direction, the intersection of the arcuate surfaces forming an upstanding ridge spaced axially from the cutting edges and extending generally laterally to the longitudinal axis, said first and second surfaces disposed at from 92° to 97° to one another to insure proper relief behind the laterally extending cutting edges.

4,241,640
RECIPROCATING ENGINE WITH IMPROVED MAIN BEARING

John H. Hedger, 11470 Oak Creek Dr., Lakeside, Calif. 92040

Filed Dec. 18, 1978, Ser. No. 970,861
Int. Cl.[3] F01B *1/00*
U.S. Cl. 91—186 4 Claims



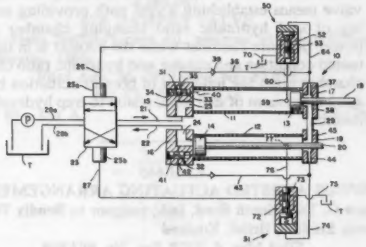
1. In a fluid driven reciprocating engine which comprises an engine block containing at least two parallel cylinders, a piston located in each of said cylinders for parallel reciprocating movement therein, a piston rod rigidly connected at one end to each of said pistons and extending out of said cylinders along the cylinder centerlines into a housing containing connecting means operatively connecting the other end of each of said piston rods to a single crank pin on a rotary output shaft and valve means within said block for selectively supplying fluid to and exhausting fluid from said cylinders above and below said pistons, said output shaft is supported by bearing means which permits free rotation of said output shaft while restraining longitudinal and angular movement of said shaft, the improvement wherein said bearing means comprises a bearing assembly made up of two spaced apart subassemblies, each of which includes a central ball bearing having an inner race secured to said output shaft and an outer race secured to an inner ring having a curvilinear outer surface which is located within an outer ring having a mating curvilinear surface said outer rings rigidly secured together in a spaced relationship by spacing means and to a wall of said housing where said output shaft passes through said housing.

4,241,641
PILOT ASSEMBLY FOR HYDRAULIC PUMPS

Gerald H. Reinert, 6 Brightwood Rd., Cold Spring, Ky. 41076

Filed Aug. 14, 1978, Ser. No. 933,443
Int. Cl.[3] F01L *21/02, 25/06*
U.S. Cl. 91—189 A 1 Claim

1. In a hydraulic pumping apparatus having
first and second main hydraulic cylinders, each of the main cylinders having an elongated bore and front and rear ends,
a main piston reciprocable within the bore of each cylinder,
hydraulic fluid supply means for supplying hydraulic fluid under pressure to the cylinders,
main valve means connecting the hydraulic fluid supply means to the cylinders for alternately supplying pressurized hydraulic fluid to the first and second cylinders, the main valve means having a pair of hydraulic fluid inlets and being alternately movable between first and second positions by hydraulic fluid alternately forced into said inlets, the main valve means being movable between a first position in which pressurized hydraulic fluid passes through the main valve means to the first cylinder and a second position in which pressurized hydraulic fluid passes through the main valve means to the second cylinder,
hydraulic fluid connecting means connected to the front end of each of the cylinders for permitting hydraulic fluid to flow from one cylinder as the piston therein is extended to the other cylinder for retracting the piston in the other cylinder; an improved pilot assembly for each of the first and second main cylinders for moving the main valve means between its first and second positions, each of the pilot assemblies comprising
a pilot cylinder,
a pilot spool in the pilot cylinder reciprocable between first and second positions,
a first fluid conduit connecting one end of the pilot cylinder to the front end of the associated main cylinder,
a second fluid conduit connecting the other end of the pilot cylinder to the associated main cylinder at a position spaced rearwardly from the front end of the main cylinder, the spacing between the second conduit and the front end of the main cylinder being sufficient to permit the



main piston in the main cylinder to pass the second conduit when the main piston is in its forwardmost position whereby pressurized hydraulic fluid flowing into the main cylinder from the hydraulic fluid supply means can flow through the second conduit into the pilot cylinder to move the pilot spool from its first position to its second position when the piston moves forwardly past the second conduit,
a third fluid conduit connecting the pilot cylinder to one of the hydraulic fluid inlets of the main valve means, and
connecting means in the pilot cylinder for providing a fluid path between the second fluid conduit and the third fluid conduit, the spool closing said fluid path when the spool is in its first position and opening said fluid path when the spool is in its second position whereby pressurized hydraulic fluid can flow from the second conduit to the third conduit and through the hydraulic fluid inlet of the main valve for moving the main valve from one of its positions to its other position when the spool is moved to its second position.

4,241,642
HYDRAULIC RATIO CHANGING BOOSTER WITH SELF-VENTING CHAMBER

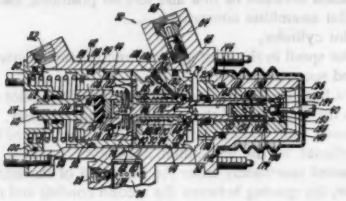
Denny L. Peeples, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1979, Ser. No. 13,826
Int. Cl.[3] F15B *13/10, 17/02*
U.S. Cl. 91—391 R 3 Claims

1. In a hydraulic power booster having means defining a power pressure chamber and a hydraulic ratio changing chamber defined by an input piston, an output piston and a ratio piston having a bore receiving said input and output pistons and forming therewith the hydraulic ratio changing chamber in which hydraulic fluid is trapped during hydraulic power actuation of said booster and caused by movement of said input

piston to act on said output piston across an effective area less than the effective area of said input piston exposed to the trapped fluid and change the booster ratio, said output piston being arranged to move a booster control valve element for controlling hydraulic power actuation of the power booster, the improvement comprising:

normally open valve means between said power pressure



chamber and said hydraulic ratio changing chamber, said valve means establishing a vent path providing self-venting of said hydraulic ratio changing chamber to said power pressure chamber while the booster is in the unactuated condition and closing said hydraulic ratio changing chamber upon the initiation of booster actuation by actuating movement of said input piston to trap hydraulic fluid therein.

4,241,643

POWER ASSISTED ACTUATING ARRANGEMENTS

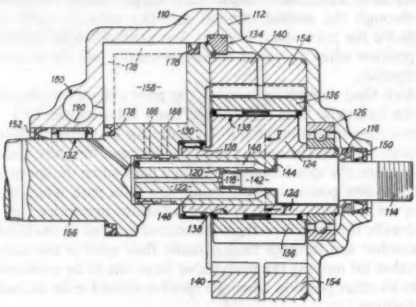
Alistair G. Taig, South Bend, Ind., assignor to Bendix Westinghouse Limited, Britol, England

Filed Mar. 6, 1978, Ser. No. 883,548

Claims priority, application United Kingdom, Mar. 5, 1977, 09405/77

Int. Cl.³ F15B *13/042, 13/10*

U.S. Cl. 91—446 **9 Claims**



1. A power assisted actuating arrangement comprising a body member, an input shaft rotatable relative to said body member, an eccentric drivingly connected to said input shaft and rotatable therewith, a gear-wheel rotatably mounted on said eccentric, said gear-wheel meshing with an internally-toothed ring rotatably mounted in said body member and having a number of gear teeth which is greater than the number of gear teeth on said gear-wheel, an output shaft of said arrangement rotatably mounted in said body member, said ring being connected to said output shaft for rotation in unison therewith, means for constraining rotation of said gear-wheel upon gyration thereof due to rotation of said eccentric whereby rotation of the eccentric is accompanied by rotation of said ring, torque sensing means operable to produce in use a fluid pressure dependent on the torque applied to said input shaft, a fluid pressure motor means responsive to said fluid pressure, said motor means being drivingly connected to said output shaft whereby said motor means drives the output shaft to increase the torque derivable from said output shaft in response to rotation of the input shaft.

4,241,644

PNEUMATIC ACTUATOR

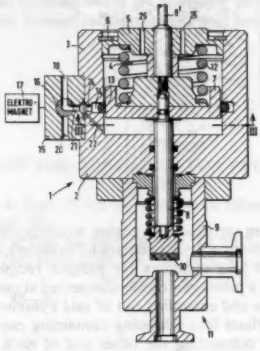
Siegfried Schertler, Haag, Switzerland, assignor to Vat Aktiengesellschaft fuer Vakuum-Apparate Technik, Haag, Switzerland

Filed Nov. 27, 1978, Ser. No. 963,809

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755239

Int. Cl.³ F01B *31/00;* F15B *13/042*

U.S. Cl. 91—447 **8 Claims**



1. A pneumatic actuator comprising:

(a) a cylinder having an axis and a face extending in the direction of and circumferentially about said axis, said face bounding a cavity within said cylinder;

(b) a piston located within and being axially movable in said cavity, said piston extending transversely of the axis of said cylinder and dividing said cavity therein into a first portion and a second portion, said face and said piston defining a gap therebetween extending in the axial direction of said cylinder and, connecting said first and second portions of said cavity for affording a flow of gas therebetween.

(1) said face being formed with a recess extending transversely of the axial direction of said cylinder and communicating with said gap;

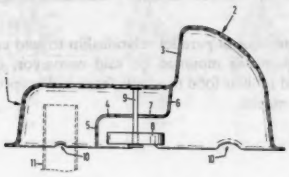
(c) a sealing member positioned in said recess and movable in said recess between a first position in sealing engagement with said cylinder within said recess and in spaced relation from said piston and a second position in sealing engagement within said recess with said cylinder and in which said second position said sealing member bridges said gap and is in sealing engagement with said piston, thereby sealing said first and second portions from the flow of gas therebetween;

(d) control means selectively positionable for admitting a gas under pressure to said first portion and to a part of said recess sealed from said gap by said sealing member wherein the gas under pressure moves said sealing member from the first position into said second position, and for closing off the flow of gas under pressure and venting the gas under pressure from said first portion and from said part;

(e) and said second portion having at least one opening therefrom for venting the gas under pressure flowing through said gap from said first portion into said second portion when said sealing member is moved into the first position; and

(f) motion transmitting means for transmitting the motion of said piston to an object outside said cavity.

4,241,645
VENTILATOR
Adolf le Comte, Stuartweg 4, 4131 NJ Vianen, Netherlands
Filed Aug. 1, 1979, Ser. No. 62,756
Claims priority, application Netherlands, Aug. 10, 1978, 7808368
Int. Cl.³ B63J *2/00*
U.S. Cl. 98—37 **4 Claims**



1. A ventilator for use with an air shaft on board a vessel, said ventilator comprising:

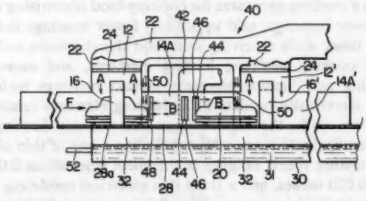
a housing comprised of a box-shaped part and an adjacently disposed hood-shaped part which is outwardly open on one side;

a plurality of transverse partitions extending in substantially opposite directions within said housing, at least one said transverse partition being internally attached to and continuous with said housing;

at least one longitudinal partition having an air inlet opening within said housing, said longitudinal partition being joined to and continuous with said transverse partition internally attached to said housing and to at least one other transverse partition, said transverse and longitudinal partitions internally dividing said housing into two adjacent compartments; and

floating means to close the air inlet opening in said longitudinal partition.

4,241,646
PAINTING BOOTH ON CONVEYOR LINE
Mitsuo Tsuruta, Tokyo, and Hachiro Haga, Zushi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 2, 1978, Ser. No. 947,639
Claims priority, application Japan, Nov. 10, 1977, 52/134091
Int. Cl.³ B05C *15/00*
U.S. Cl. 98—115 SB **8 Claims**



1. A painting booth through which a conveyor passes substantially horizontally to transfer articles to be painted, the booth comprising:

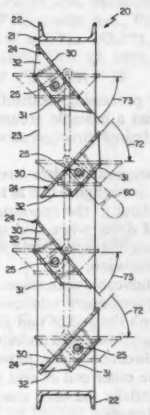
two spraying spaces located with a distance therebetween in the direction of the conveyor, each having a paint spraying machine disposed therein;

a buffer space which is interposed between said two spraying spaces so as to occupy an entire length of said distance and adjoin both of said two spraying spaces and is smaller in cross-sectional area than either of said two spraying spaces,

at least one first duct for blowing air into each of said two spraying spaces through air inlets, each said spraying space having an at least partly grated floor, said air inlets provided for said at least one first duct being located on the ceiling of the spraying space such that a flow of air is established in a direction generally vertically downwards substantially in every region of each of said two spraying spaces, and

a second duct for blowing air into said buffer space through two sets of air inlets, said sets of air inlets being located in said buffer space, having one set of inlets directed toward one adjacent spraying space and the other set of inlets directed toward the other adjacent spraying space such that air flows in said buffer space generally horizontally and towards said two spraying spaces at velocities lower than the velocity of said flow of air in each of said two spraying spaces.

4,241,647
AIR DAMPER VALVE
Leroy E. Herr, Buffalo Grove, Ill., assignor to Dayco Corporation, Dayton, Ohio
Filed Aug. 20, 1979, Ser. No. 67,853
Int. Cl.³ F24F *13/14*
U.S. Cl. 98—121 A **19 Claims**



1. In an air damper comprising; a housing structure; a plurality of opposed blades each having rotatable shaft means and flow control plates; said blades having means supporting said shaft means on said housing structure enabling said control plates to be disposed in aligned relation to define a substantially planar shut-off structure for said damper and to regulate air flow therethrough; the improvement wherein said means supporting said shaft means comprises bearing means supporting said shaft means of one blade on one side of said planar structure and the shaft means of an immediately adjacent blade on the opposite side of said planar structure; a linkage system for operating said shaft means; and operating means for operating said shaft means and said linkage system; said bearing means, blades, and linkage system being constructed and arranged so that upon operation of said operating means the rotational displacement of each blade from any reference position is approximately the same and the air flow distribution throughout the flow area of said damper is substantially uniform; said linkage system comprising, an arm fixed to each shaft means at the same side of each blade, said arms being of equal length and with said blades disposed in said aligned relation and defining said planar shut-off structure the arm of one blade extends from

its shaft means generally in one direction toward said planar shut-off structure and the arm of an immediately adjacent blade extends from its shaft means in a direction roughly opposite from said one direction toward said planar shut-off structure, and a plurality of links connected between said arms, each of said links extending between the terminal outer ends of each pair of immediately adjacent arms.

4,241,648

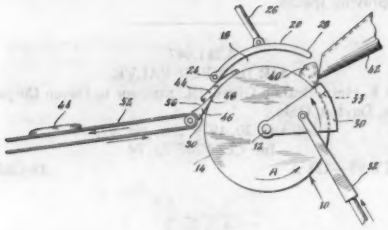
APPARATUS FOR SHAPING AND PRECOOKING OF TORTILLAS

John G. Longenecker, Ozone Park, N.Y., assignor to Roberto G. Barrera, Monterrey, Mexico

Continuation-in-part of Ser. No. 849,890, Nov. 9, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 26,368

Int. Cl.³ A21C *3/00*

U.S. Cl. 99—349 **10 Claims**



1. Apparatus for processing foodstuff material comprising

a drum which has a heatable arcuate outer surface and is rotatable in a desired direction about the axis of said outer surface,

an associated compression plate having a heatable arcuate surface which is configured so as to be substantially equidistant throughout to the opposing portion of said outer surface of said drum when said surfaces are juxtaposed spaced apart at a distance desired for processing foodstuff material therebetween,

said plate being moveable with respect to said drum into said juxtaposed, spaced-apart relationship, and out of said relationship with the end of said plate which the advancing drum surface first passes under when said drum rotates in a desired direction being moveable away from said drum while the other end of said plate remains pivotally fixed in substantially the same spaced-apart position with respect to said drum,

motion means for rotating said drum in said desired direction,

and means for moving said plate into said juxtaposed spaced-apart relationship and out of said relationship.

4,241,649

APPARATUS FOR MAKING FILLED FOOD PRODUCT

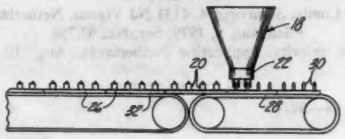
Richard L. Nelson, and Walter P. Nelson, both of Battle Creek, Mich., assignors to Mars Incorporated, McLean, Va.

Division of Ser. No. 930,757, Aug. 3, 1978, Pat. No. 4,162,333. This application Jan. 15, 1979, Ser. No. 3,226

Int. Cl.³ A47J *37/00*

U.S. Cl. 99—354 **9 Claims**

1. Apparatus for making a tubular food product comprising; a dough extruder, a conveying surface movable relative to said dough extruder, a die member supported on said conveying surface for movement therewith, said die member including a plurality of elongated support members positioned to extend perpendicular to said conveying surface, said extruder being operable to deposit a tubular dough piece on each of said support members, said support members engaging and supporting the interior surface of said tubular dough pieces and leaving the exterior of said dough pieces unsupported, and means to bake said dough pieces supported on said support members to form said tubular food product, means to remove said tubular elements from said support member after said tubular elements have been baked in said oven, a conveyor having a



portion moving in parallel relationship to said conveying surface, cup means mounted on said conveyor, and means to move said tubular food products from said support members to said cup means.

4,241,650

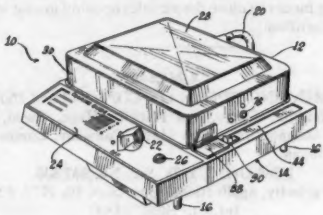
APPARATUS FOR PREPARING FOOD

Raymond John, 311 Charles St., Carpentersville; Jerome G. Apfelbaum, 516 Berkley Dr., Arlington Heights, and Robert L. Moore, 919 Coronet La., LaGrange, all of Ill.

Continuation of Ser. No. 460,798, Apr. 15, 1974, abandoned, and a continuation-in-part of Ser. No. 292,479, Sep. 27, 1972, abandoned. This application Jun. 7, 1976, Ser. No. 693,548

Int. Cl.³ A47J *37/06*

U.S. Cl. 99—372 **15 Claims**

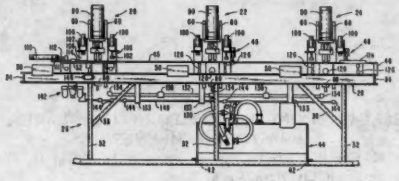


1. In a cooking apparatus for cooking food comprising upper and lower housings, said upper and lower housings defining facing inner walls receiving said food therebetween and providing cooking surfaces, heating elements, and means for mounting said heating elements in said housings including means electrically insulating the heating elements relative to said inner walls, the improvement wherein said heating elements comprise thin assemblies including a pair of thin electrical insulating sheets ranging in thickness from about 0.010 to about 0.020 inches, and a third thin electrical insulating sheet ranging in thickness from about 0.010 to about 0.020 inches, said third sheet carrying electrical resistance wires and being sandwiched between said pair of sheets, the sandwich assembly comprising said heating elements having a maximum thickness of about 0.060 inches, and wherein said housings define a substantial air space around said assemblies to provide thermal insulation against the transfer of heat from the assemblies to the housing said mounting means mounting one of said assemblies in each housing, said mounting means holding the respective assemblies in position adjacent said inner walls.

4,241,651
ASSEMBLY MACHINE AND METHOD FOR EMBEDDING CONNECTOR PLATES IN STRUCTURAL MEMBERS

Adolfo Castillo; Ben Kushner, and Andrew G. Seipos, all of Miami, Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed May 9, 1979, Ser. No. 37,458
Int. Cl.³ B30B *1/32, 15/00*
U.S. Cl. 100—35 **30 Claims**



27. A method of embedding connector plates in structural members, comprising:

supporting the structural members on a work support surface;

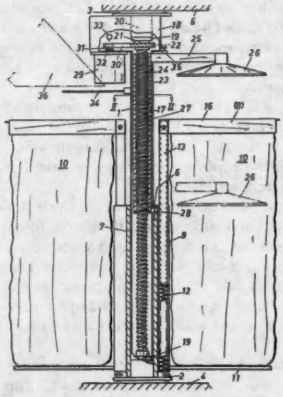
placing a first connector plate on a lower platen normally located below said work support surface and movable upward relative to said surface;

placing a second connector plate on top of the wooden members for engagement by an upper platen movable downward toward said lower platen; and pressing said upper platen downward into engagement with the second connector plate and independently raising said lower platen upward relative to said work support surface to press the first and second connector plates into opposite sides of the structural members.

4,241,652
DEVICE FOR OBTAINING COORDINATED MOVEMENTS OF OPERATIVE MEMBERS INCORPORATED IN A MACHINE OR A PLANT

Kurt H. Smedlund, Karl XI väg 45B, Halmstad, Sweden (301 02)

Filed Feb. 1, 1978, Ser. No. 874,334
Claims priority, application Sweden, Feb. 10, 1977, 7701475
Int. Cl.² B30B *15/14*
U.S. Cl. 100—49 **8 Claims**

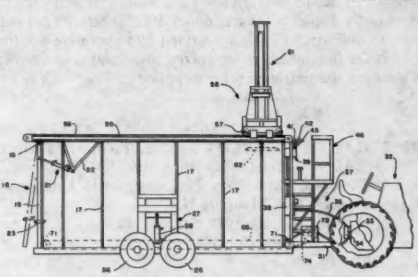


1. A device for producing complex relative movements in at least two different planes between working members of the device, comprising a rotatable sleeve secured to one working member, said rotatable sleeve having internal complex movement guide tracks arranged in a repetitive cycle according to a predetermined programmed pattern of relative movements for said working members, a coacting non-rotatable element mounted for axial displacement inside of the sleeve and being elongated and secured to a second working member of the device, a transversely projecting part on said non-rotatable element engaging within the internal guide tracks of said rotatable sleeve, and a driver for said non-rotatable element within said rotatable sleeve causing it to move axially of the sleeve in a direction to move the second working member of the device longitudinally of the sleeve toward a work performing position, and during such movement the engagement of said projecting part in one of said internal guide tracks producing rotation of the sleeve on its axis to impart rotation to said first working member relative to the second working member in a repetitive cycle of operation.

4,241,653
BANK OUT MODULE BUILDER WITH UNLOADING MECHANISM

John L. Fagundes, 8576 Fargo Ave., Hanford, Calif. 93230, and Clyde L. Taylor, 1545 Chenowith Ave., Visalia, Calif. 93277

Continuation-in-part of Ser. No. 953,071, Oct. 20, 1978, abandoned. This application Feb. 12, 1979, Ser. No. 11,484
Int. Cl.³ B30B *9/30*
U.S. Cl. 100—100 **12 Claims**



1. In a bank out module builder with an unloading mechanism adapted to be drawn by a self propelled vehicle, a generally rectangular framework having an open top side and having spaced apart sidewalls and spaced apart front and rear walls, and a bottom wall structure, the rear being formed by a door movable between open and closed position, and in the open position being raised upwardly to an out-of-the-way position, ground engaging members carried by the framework, a carriage mounted on said framework for movement longitudinally of the framework between the front and rear walls, means carried by the framework for causing movement of said carriage between the front and rear walls, a tramper mechanism carried by the carriage and having a tramper and means for moving said tramper vertically within said framework for forming a module within the framework, means carried within the framework for discharging through the rear of the framework a module formed within the framework and means adapted to form a connection between the bank out module builder and the self propelled vehicle to permit the rear of the framework to tilt downwardly under the weight of the module as the module is moved through the rear of the framework so that the module can readily be moved into close proximity to the ground to the rear of the bank out module builder as it is discharged to minimize any possible break up of the module.

4,241,654

FLY-WHEEL

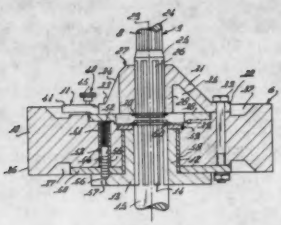
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed May 15, 1978, Ser. No. 905,965

Claims priority, application Netherlands, May 5, 1977, 7704935

Int. Cl.³ B30B 1/00; F16D 7/00

U.S. Cl. 100—189 **12 Claims**



1. A baler comprising a pressing ram and a driving mechanism that drives said ram, said driving mechanism comprising a fly-wheel, said fly-wheel comprising a first member and a second member connected by shear means for rotation together about a common axis, said first member being mounted on a driving shaft and said second member being mounted on a driven shaft, the two members being relatively rotatable with respect to one another about said axis upon overload, said shear means including at least one shear pin slideably mounted in a holder and said pin normally interconnecting said members to prevent relative rotation until overload fractures said pin, advancement means operatively associated with said pin that automatically displaces the remainder of the fractured pin with respect to said axis following overload into operative position in which the two members are reconnected and relative rotation between the two members prevented.

4,241,655

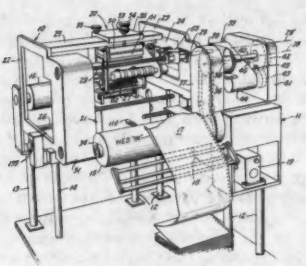
PRINTER WITH INDEXED ORIENTATION OF PRINT HEAD RELATIVE TO WEB MOVEMENT

Arthur E. Dingman, Little Ferry, N.J., assignor to Autographic Business Forms, Inc., Mahwah, N.J.

Filed Feb. 23, 1979, Ser. No. 14,556

Int. Cl.³ B41J 3/56

U.S. Cl. 101—79 **25 Claims**



1. In a printing machine comprising a frame, a printing-head unit carried by said frame and including a printing head having an elongate characterized relief to be cyclically printed in essentially a single plane at spaced locations on a moving web, web-guiding and feeding means on said frame for continuously advancing said web in said plane adjacent said printing head, and a print-hammer unit carried by said frame and having an elongate anvil in facing registration with the characterized relief of said printing head, the improvement wherein each of said units is indexibly mounted to said frame about an index axis normal to said plane, and synchronizing-connection means between said printing-hammer unit and said feeding means for synchronizing operation of said printing-hammer unit with said feeding means for each selected one of a plurality of orientations of anvil and relief elongations with respect to the direction of web advance.

4,241,656

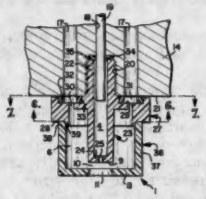
SELF-CLEANING NOZZLE FOR LITHOGRAPHIC PRINTING DAMPENERS

Gary R. Smith, Bucyrus, Kans., assignor to Smith R. P. M. Corporation, Overland Park, Kans.

Filed Nov. 17, 1978, Ser. No. 961,532

Int. Cl.³ B41F 7/30; B41L 25/06

U.S. Cl. 101—148 **2 Claims**



1. A self-cleaning nozzle for use in forming a fine spray of dampening liquid in a lithographic printing system, said system including respective sources of air and of liquid, both at greater than atmospheric pressure, said nozzle comprising:

(a) means forming an elongated liquid duct, said duct including a termination and communicating with said source of liquid;

(b) means forming an air passage, said passage communicating with said source of air;

(c) a housing defining an air expansion chamber communicating with said air passage;

(d) said housing including an end wall spaced from said termination of said liquid duct and forming a mixing corridor therebetween, said mixing corridor having said air expansion chamber with said liquid duct in communication therewith;

(e) said end wall being positioned for substantially perpendicular impingement by air before entering said mixing corridor to thereby effect turbulence in said air for the breakup into droplets of a stream of said liquid issuing from said duct termination;

(f) an orifice formed in said end wall for the turbulent exit of said droplets and air from said nozzle for further breakup and transport of said droplets into a fine spray;

(g) said housing including a circumferential wall spaced radially from said means forming said liquid duct and defining said air expansion chamber in cooperation therewith, said chamber being bounded at one end by said end wall;

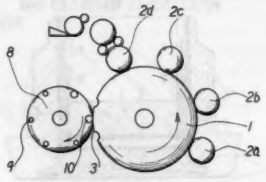
(h) a baffle extending between said means forming said liquid duct and said circumferential wall, said baffle bounding another end of said air expansion chamber; and

(i) a plurality of circumferential slits formed in said baffle, said slits extending in surrounding relation to said means forming said liquid duct and providing communication between said source of air and said air expansion chamber.

4,241,657
FOUR-COLOR HALFTONE PRINTING PROCESS FOR OBJECTS HAVING CURVED SURFACE

Hikoichiro Fujimori, Osaka, Japan, assignor to Takeuchi Press Industries Co., Ltd., Toyama, Japan

Filed Oct. 24, 1978, Ser. No. 954,246
Claims priority, application Japan, Jul. 15, 1978, 53-86536
Int. Cl.[3] B41F 17/08; B41M 1/14
U.S. Cl. 101—211 3 Claims

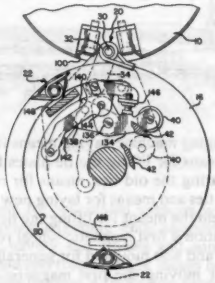


1. In a process for four-color halftone printing by a dry offset printing system onto an object having a curved surface by transferring halftone images from four halftone blocks of block cylinders arranged around a blanket cylinder onto the blanket and then transferring the images onto the object, the improvement comprising maintaining the tackiness values of four inks consisting of first, second, third and fourth inks such that the first ink has the highest tackiness value and the fourth ink has the lowest tackiness value, wherein the difference in tackiness value between each of said four inks is at least 1, transferring the four halftone images from the halftone blocks onto two transfer areas on the blanket cylinder, the two transfer areas consisting of a first transfer area and a second transfer area positioned sequentially in the circumferential direction of the blanket cylinder, such that the image of said first ink is transferred onto said first transfer area as an under layer onto which the image of said second ink having the secondarily high tackiness value is transferred, and the image of said third ink is transferred onto said second transfer area as an under layer onto which the image of said fourth ink is transferred, and transferring the images transferred onto said first transfer area and the images transferred onto said second transfer area in order onto the objects in layers.

4,241,658
DUPLICATING MACHINE WITH DUPLEXING CAPABILITY

Mario J. Ricciardi, Glenview, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed May 30, 1978, Ser. No. 910,640
Int. Cl.[3] B41F 5/02, 21/04, 21/08, 5/22
U.S. Cl. 101—217 27 Claims

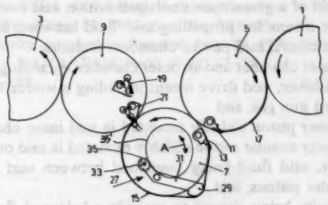


1. In a duplicating system including transfer means defining a surface carrying images transferrable to copy sheets, a carrier mounted adjacent said transfer means, first and second grippers associated with the carrier, and means for feeding copy sheets to said first gripper whereby the first gripper holds the sheets on the carrier during transfer of images from said surface to said sheets, the improvement comprising mounting means for one of said grippers, means for moving said mounting means relative to the other gripper to vary the distance between the grippers, and means for locking said mounting means and associated gripper in place relative to the carrier to maintain the relative positions of said grippers during a duplicating operation, said mounting means including portions extending outwardly beyond the periphery of the carrier, the gripper associated with the mounting means being attached to said outwardly extending portions and extending along the length of the carrier between said portions, and wherein the gripper associated with the mounting means includes opposed sets of gripping jaws, coaxial shaft means comprising one shaft portion supporting one set of said jaws, and another shaft portion supporting the other set of jaws, and means for driving one portion of the coaxial shaft means relative to the other portion for opening and closing said jaws.

4,241,659
SHEET TRANSFER APPARATUS FOR ROTARY PRINTING MACHINES HAVING SERIALLY ARRANGED PRINTING STATIONS

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,435
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724621
Int. Cl.[3] B41F 21/04, 7/04
U.S. Cl. 101—231 10 Claims



1. In a rotary printing maching having serially arranged printing stations (1, 3) including printing cylinders having a circumference accepting a single sheet thereon,

a sheet transfer apparatus including sheet reversal means located between two printing stations comprising the combination of

a continuously rotating sheet storage and transfer drum (7) of approximately the same diameter as said cylinders including storage drum gripper means (13) engageable with the front edge of a sheet transferred thereto; and

a sheet transport drive reversal cylinder (9) located downstream of the storage drum (7) including reversal gripper means (19, 21) selectively engageable with the front edge or the rear edge of a sheet located on the storage and transfer drum (7) for transfer to the sheet transport and reversal drum (9), selectively, either in the same orientation or turned over; with

sheet displacement means (27) located on the sheet storage and transfer drum (7) rearwardly—with respect to the direction of rotation thereof—of the storage gripper means (13) and movable between a position corresponding to the circumference of the storage and transfer drum and a position lifted off the circumference of the storage and transfer drum and thereby lift at least a portion of the sheet (15) on the storage drum off at least a portion of the circumference thereof;

and means (35, 35') controlling movement of said sheet

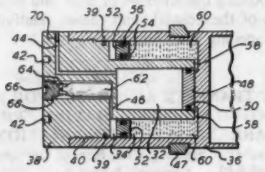
displacement means during rotation of the storage and transfer drum (7) to selectively locate the position of the rear edge of the sheet (15) remote from the gripped edge to be closer to the front edge gripped by the storage and transfer drum gripper means (13) at selected angular positions of the storage drum than when the sheet is in engagement with the entire curcumference of the storage drum.

4,241,660

PROJECTILE

William F. Donovan, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1978, Ser. No. 948,127
Int. Cl.³ F42B *11/22*
U.S. Cl. 102—56 R **7 Claims**



1. A projectile having variable stability, said projectile being arranged to be spin stabilized and comprising:

a casing having a cavity wherein said cavity is shaped to provide a pair of chambers, each communicating with the other;

a fluid of a given mass contained within said cavity;

drive means for propelling said fluid between said pair of chambers, said pair of chambers includes;

an inner chamber and an outer chamber encircling said inner chamber, said drive means including a source of pressurized gun gas; and

an inner piston slidably mounted in said inner chamber;

an outer annular piston slidably mounted in said outer chamber, said fluid being contained between said inner and outer pistons; and

said cavity being shaped to provide a balanced flow of said fluid with respect to the axis of spin as said projectile is trajected, said balanced flow altering the flight stability of said projectile.

4,241,661

COMPOSITE PROPELLANT WITH SURFACE HAVING IMPROVED STRAIN CAPACITY

Donald E. Elrick, Rawlings, and Harry Gilbert, Cumberland, both of Md., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 667,623, Sep. 6, 1967, Pat. No. 3,948,698. This application Dec. 4, 1968, Ser. No. 781,285
Int. Cl.² F42B *1/00*; C06B *45/10*
U.S. Cl. 102—103 **16 Claims**

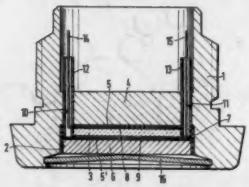
1. In a composite propellant wherein the binder component comprises a carboxy terminated rubber selected from the group consisting of elastomeric polymers of at least one conjugated diene containing 4 to 8 carbon atoms and elastomeric polymers of at least one olefin containing 2 to 4 carbon atoms, cured with an epoxide curing agent therefor, the improvement comprising a coating of a propellant antioxidant material on an initial burning surface of said propellant in an amount sufficient to impart to said burning surface an increase in strain capability and an increase in resistance to oxidative hardening and to provide at least about 0.0005 gram/square centimeter of said surface.

4,241,662

ELECTRICAL PROJECTILE DETONATOR

Werner Rüdenauer, Roth, and Ralf Siewert, Nuremberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,106
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 2746599
Int. Cl.³ F42C *11/02*
U.S. Cl. 102—210 **8 Claims**



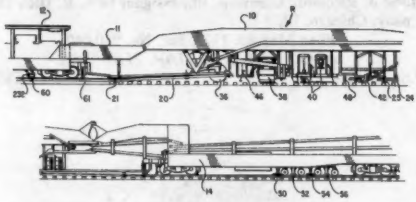
1. In an electrical projectile detonator, particularly a base detonator, including a piezoceramic cell as a current generator; and a pyrotechnic impelling charge adapted to produce a gas pressure for generating a voltage in said cell; the improvement comprising: a cup-shaped recess being formed in the tail end of the projectile base, said piezoceramic cell being arranged in said recess; an intermediate base element in said projectile base constituting an anvil contacted by said cell; a pressure plate enclosing said cell in said recess; and a closure disc in the tail end of said projectile base, said closure disc being constituted of a deformable material and inwardly curved towards said piezoceramic cell, said closure disc further being prestressed and flanged into the tail end of said projectile base, said pressure plate being pressable against said piezoceramic cell responsive to the gas pressure of the projectile impelling charge acting on said closure disc at the discharge of said projectile.

4,241,663

TIE PLATE HANDLING MEANS FOR RAIL CHANGING MACHINE

Raymond R. Lund, West Columbia, and Hung C. Ho, Columbia, both of S.C., assignors to Canron Corporation, West Columbia, S.C.

Filed Oct. 13, 1978, Ser. No. 951,130
Int. Cl.³ E01B *29/24*; B03C *1/12*
U.S. Cl. 104—16 **18 Claims**



1. A rail changing machine having means for removing rails from a track, means for lifting the tie plates from the old ties, means for preparing the old ties, means for relaying tie plates or the prepared ties and means for laying new rails in the relaid tie plates, wherein the means for lifting the tie plates comprises at each rail location a first magnetic wheel rotatably mounted on a lateral axis and also mounted for generally vertical movement, means for moving the first magnetic wheel vertically downward for engagement by its periphery with a tie plate on a tie and vertically upwards for raising the subsequently adhered tie plate off the tie, means for rotating stepwise the first magnetic wheel in the raised position to index a vacant space

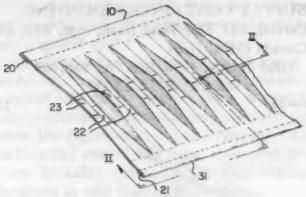
on the wheel periphery to a downward facing location of the wheel, means for removing from the magnetic wheel tie plates adhered thereto, and means for conveying the removed tie plates to a desired location.

4,241,664

FORMABLE DRIVE RAILS

Harold E. Cable, Thornburg Borough, Pa., assignor to Weld Tooling Corporation, Pittsburgh, Pa.

Filed Mar. 13, 1979, Ser. No. 20,211
Int. Cl.³ B61B *13/02, 13/04*
U.S. Cl. 104—118 **8 Claims**



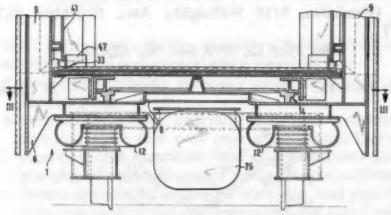
1. An elongate formable drive rail for carrying a working apparatus having a toothed driving gear drivingly engaging said rail and support means engaging a portion of the edge of the side rail for supporting said apparatus comprising an elongate narrow strip of metal of width selected to carry said working apparatus, having opposite faces and opposite side edges, a regular series of corrugations formed in said strip on both faces extending lengthwise of said strip intermediate its edges, said corrugations corresponding substantially in shape and width along the median line of the strip to the tooth configuration of the toothed driving gear of said working apparatus and sloping therefrom on each side to the plane of the strip to form a substantially smooth uncorrugated edge portion on each side of said corrugations receiving the support means for the working apparatus.

4,241,665

ARTICULATED RAILWAY CAR CONNECTING PASSAGE

Karl-Heinz Kleim, Nürnberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nürnberg, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 852,987
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652819
Int. Cl.³ B61F *3/12, 5/16;* **F16C** *19/18, 33/80*
U.S. Cl. 105—4 R **12 Claims**



1. A linking system for articulated vehicles which includes two car bodies having adjoining ends supported on bogie means, said bodies having end trusses and supporting arms extending beyond said end trusses, bogie means having a frame supporting said bodies thereon, a transverse support resiliently supported on said frame, the supporting arms of the adjoining ends of said bodies being pivotally supported on said transverse support, a one-piece connecting portal interposed between and interconnecting said first and second bodies and carried on said transverse support, bellows connecting said portal to adjacent car bodies of said vehicles, said connecting portal comprising a platform resiliently movable in a universal direction, said platform being arranged on said transverse support, and a dual-row ball race structure including a rotation ball race coaxial with said platform and together with said supporting arms pivotally supporting said platform, said rotation ball race having three race rings effecting relative motion independently of each other and two rows of balls, and the supporting arms of one body being supported on one of said race rings and the supporting arms of the other body being supported on another one of said race rings, and the third race ring of said race rings being supported on said transverse support supporting said portal and said platform, and being concentric with and positioned between said other two race rings and supporting said other two race rings on bearings therebetween.

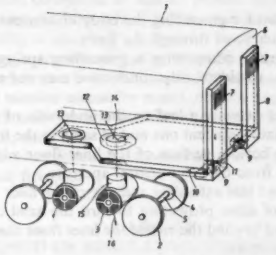
12. In an articulated rail vehicle having two car bodies with their adjoining ends pivotally supported about a vertical pivotal axis on bogie means, a bearing structure for supporting said ends comprising: three concentric bearing races coaxial with the pivotal axis for said adjoining ends, including an intermediate race supported on said bogie means, and inner and outer races supported on said intermediate race by bearings therebetween, the adjoining end of each car body extending over one of said inner and outer races, respectively, and supported thereon, so that each end is supported on one of said races for pivotal movement relative to said intermediate race and said bogie means independently of the other adjoining end.

4,241,666

RAILWAY CAR ELECTRIC TRACTION MOTOR AIR COOLING SYSTEM

Lage Marcusson, and Lars Polheimer, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Aug. 11, 1977, Ser. No. 823,675
Claims priority, application Sweden, Aug. 19, 1976, 7609214
Int. Cl.³ B61C *3/00, 9/38, 17/00*
U.S. Cl. 105—59 **3 Claims**



1. A motorized railway vehicle comprising an elongated vehicle body having ends, and at least one supporting truck for said vehicle body; each said truck including two driven wheelsets, and each truck including an air-cooled electric traction motor connected to drive the wheelsets, each traction motor including an air intake means extending towards said vehicle body and an air exhaust port; said vehicle body including a common hollow cooling air channel with means for supplying cooling air to each said air intake means of each traction motor, means forming two separate cooling air intakes which are mounted on the ends of said vehicle body, means forming two separate air intake channels for conveying air from each respective said air intake means to said common, hollow cooling air channel in a parallel fashion, separate fans positioned in each air intake channel for forcing air into said common, hollow cooling channel, and separate valve means positioned between each said air intake channel and said common hollow

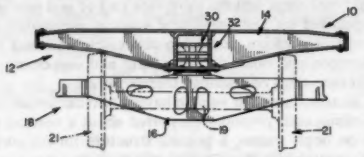
cooling air channel for preventing any return air flow from said common, hollow cooling air channel to each said air intake channel.

4,241,667

GROUNDED RAILWAY CENTER PLATE LINER

Cal W. Wulff, Elmhurst, Ill., assignor to Holland Company

Filed Jul. 27, 1979, Ser. No. 61,528
Int. Cl.³ B61F *5/16, 5/50;* **F16C** *17/04;* **H01R** *39/46*
U.S. Cl. 105—199 C **15 Claims**



1. In a liner formed from a dielectric self lubricating polymer material for application in its operative position between a body bolster center plate and a truck bolster bowl of a railroad car center plate assembly that pivotally connects the car body to the car truck, with the bolster bowl having a floor for supporting the center plate and a side wall in circumambient relation of the bowl floor, the body bolster center plate having a floor that is supported by the bolster bowl floor and a side wall in circumambient relation to the body bolster center plate floor, and the liner being of bowl configuration and defining a floor, on which the body bolster center plate floor is to rest, in the operative position of the liner, an upstanding side wall in circumambient relation about the liner floor that separates the bolster bowl side wall from the body bolster center plate side wall, and an aperture at the axial center of the liner floor for receiving the truck centerpin that pivotally connects the body bolster center plate to the bolster bowl with the liner interposed therebetween, for pivotally connecting the car body to the car truck,

an arrangement for grounding the body bolster center plate to the bolster bowl through the liner,

said arrangement comprising a grounding spring formed from a strip of electrically conductive material and comprising:

an attachment providing leaf on the underside of the liner floor and fixed adjacent one end of same to the liner flush against the bottom surface of the liner floor adjacent to but spaced from the liner central aperture,

said attachment leaf extending radially of the liner with the other end of same projecting toward the axial center of the liner and beyond the rim of the liner floor that defines the liner aperture,

said grounding spring further including a bight portion disposed in the liner aperture, and a follower contact grounding leaf extending radially of the liner over the top surface of the liner floor in overlying relation to the liner floor and said attachment leaf thereunder,

said bight portion being proportioned transversely of said leaves to engage the liner aperture defining rim at the side edges of the strip and having a radius that approximates one half the thickness of the liner floor,

said follower contact leaf being integral with said bight portion at one end thereof, and having its other end free of securement to said liner,

said follower contact leaf in its free standing relation relative to the liner floor having a flat acute angulation relative to the liner floor with said other end thereof diverging from the liner floor radially outwardly of the liner floor,

whereby when said liner is in its said operative position, said attachment leaf is in flush contact with the floor of the bolster bowl, and said contact leaf is pressed by the body bolster center plate floor flush against the liner bowl floor top surface radially outwardly of the liner aperture rim,

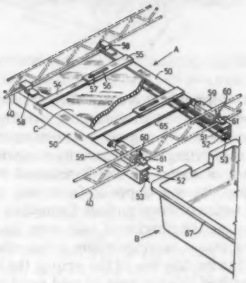
said follower contact leaf at and adjacent said liner rim being indented into the liner by the compressive forces of the body bolster center plate floor acting on said contact leaf at an acute angle relative to the liner floor top surface whereby said contact leaf is maintained in biased engagement with the body bolster center plate floor for following movement of the body bolster center plate relative to the bolster bowl on car body roll relative to the car truck.

4,241,668

SUPPLY CONTAINER MOUNTING

Wilfred J. Carroll, 511 The West Mall, Apt. 410, Etobicoke, Ontario, Canada (M9C 1G5)

Filed Dec. 4, 1978, Ser. No. 966,143
Int. Cl.³ A47B *85/00*
U.S. Cl. 108—26 **15 Claims**



1. A mounting device for mounting a container on a superstructure having substantially horizontal spaced-apart supporting members, comprising,

an open frame for suspension between the supporting members for supportably engaging the container and made up of spaced-apart beams each having a top surface,

a fixed hook member mounted on the top surface adjacent one end of each beam,

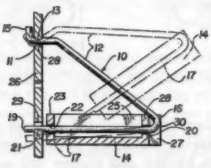
mounted adjacent the other end of each beam a housing in which there is slidably operable a plunger, spring means urging the plunger outward from the housing, and manipulating means on the other end of the plunger for retraction.

4,241,669

SHELF AND BRACKET ARRANGEMENT

Joseph Giambalvo, 1118 Willoughby Ave., Brooklyn, N.Y. 11237

Filed May 25, 1979, Ser. No. 42,422
Int. Cl.³ A47B *5/00, 10/00*
U.S. Cl. 108—152 **21 Claims**



1. In a shelf arrangement, comprising

supporting means having vertically spaced perforations therebetween;

at least two open triangle brackets, each consisting of two sides, one of said sides comprising an upper extension terminating in a hook having a depressed portion therein, and the other of said sides comprising a generally horizontally extending lower extension connected at one end to the end of said upper extension opposite said hook and terminating at the other end thereof without the axis thereof departing from said generally horizontal line, the terminal end thereof having a downwardly directed notch therein, said upper extension extending from said horizontally extending lower extension at an acute angle, said upper and lower extensions being resiliently biased to a rest position at which said hook and the end of said lower extension are farther apart than the vertically spaced perforations of said supporting means in which said brackets are engaged; and

a shelf member having two apertures through which said lower extensions of respective ones of said brackets extend to support said shelf member in a horizontal position, thereby positively connecting said brackets with said shelf member, the depressed portion of said hook and the notch in the terminal end of said lower extension of each of said brackets lockably engaging the said vertically spaced perforations in said supporting means,

the improvement wherein said shelf member further includes, for each said bracket, a notch means for maintaining said bracket in a plane perpendicular to that of said shelf member, each said notch means comprising a single three-walled notch formed in said shelf member such that the upper extension of said bracket must pass therethrough.

4,241,670

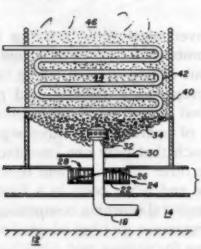
COAL FEED SYSTEM FOR A FLUIDIZED BED BOILER

Henry J. Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 884,651, Mar. 8, 1978, Pat. No. 4,176,623. This application Mar. 19, 1979, Ser. No. 21,396

Int. Cl.³ F23K *3/02*

U.S. Cl. 110—104 R **2 Claims**



1. An apparatus for feeding coal into a fluidized bed combustion cell having a bed support plate, comprising:

a. coal pipe extending vertically upward through the bed support plate;

b. vertically orientated, generally cylindrical coal distributor mounted upon said coal pipe and opening thereto for receiving coal therefrom, said coal distributor having a plurality of openings spaced around its circumference;

c. means operatively associated with said coal pipe for imparting a swirl to the coal before the coal enters said coal distributor;

d. means for supplying ignitor fuel to the fluidizer bed combustion cell comprising a first gas pipe positioned interior to and concentric with said coal pipe and extending into said coal distributor;

e. a second gas pipe having openings in both ends disposed in said coal distributor in communication with and at right angles with said first gas pipe, each of said end openings being in registration with one of said plurality of openings spaced around the circumference of said coal distributor; and

f. means operatively associated with said ignitor fuel supply means for igniting said ignitor fuel so as to create a flame for igniting the coal supplied through said coal pipe.

4,241,671

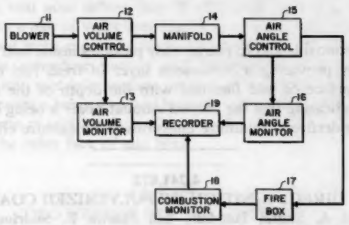
AIR-CURTAIN INCINERATOR FOR ENERGETIC MATERIALS

Taylor B. Joyner; Albert H. Lepie, both of Ridgecrest, and Charles D. Stanifer, China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1979, Ser. No. 39,920

Int. Cl.³ F23N *5/18*

U.S. Cl. 110—188 **10 Claims**



1. An incinerator, comprising;

a fire box;

blower means for supplying air to said fire box connected thereto;

air volume control means connected to said blower means, for controlling the volume of air supplied to said fire box;

first monitor means for monitoring the volume of air supplied to said fire box connected to said air volume control means;

a manifold connected to said air volume control means for injecting air into said fire box, said manifold having a plurality of nozzles;

an air angle control means for controlling the angle at which air enters said fire box connected thereto;

second monitor means for monitoring the angle at which air enters said fire box connected to said air angle control means; and

third monitor means for monitoring combustion connected to said fire box.

4,241,672

METHOD OF REGULATING THE AMOUNT OF UNDERFIRE AIR FOR COMBUSTION OF WOOD FUELS IN SPREADER-STROKE BOILERS

Kenneth L. Tuttle, Federal Way, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 4, 1978, Ser. No. 966,523

Int. Cl.³ F23G *5/02*

U.S. Cl. 110—346 **1 Claim**

1. A method for reducing particulate emissions from wood residue fuel combustion on a pinhole grate in a spreader-stoker furnace comprising:

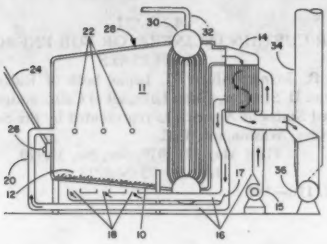
evenly distributing wood residue fuel feed over a fuel bed on said grate,

distributing an underfire portion of the combustion air equal to about one pound of air per pound of dry fuel to said fuel through said pinhole grate sufficient to convert the solid carbon in said fuel to carbon monoxide gas,

distributing an overfire remainder of the combustion air equal to from about 5½ to 12 pounds of air per pound of air

per pound of dry fuel above said fuel bed to complete combustion of said carbon monoxide gas and combustible volatile matter,

and maintaining said fuel bed at a depth equal to from about 3 to 8 inches sufficient to convert said carbon to carbon



monoxide and to entrap char particles inside said fuel bed by providing a continuous layer of fresh fuel over the surface of said fuel bed with the depth of the fuel bed indicating that the correct amount of air is being supplied underfire to minimize emissions and maximize efficiency.

4,241,673

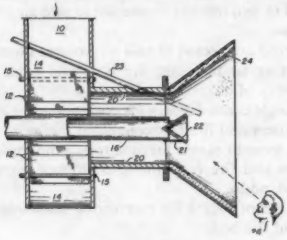
DIRECT IGNITION OF PULVERIZED COAL

Donald A. Smith, Haddam, and Martin E. Smirlock, East Granby, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 865,747, Dec. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 769,995, Feb. 18, 1977, abandoned. This application Nov. 5, 1979, Ser. No. 91,534

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **20 Claims**



1. A method for reliably igniting pulverized coal in the absence of any other fuel and in the absence of sufficient inherent ignition energy to insure ignition comprising the steps of:

forming an ignitable mixture, the step of forming an ignitable mixture including:

providing a source of pulverized coal, the coal having a sufficiently small particle size such that the coal may undergo rapid thermal decomposition; and

withdrawing the pulverized coal from the source and entraining the thus withdrawn coal in transport air to form a dense phase fuel stream having an air-to-coal weight ratio which is less than 0.5;

delivering the fuel stream to a combustion zone, there being insufficient ignition energy present in the combustion zone to insure ignition of the pulverized coal in the fuel stream;

discharging the fuel stream into the combustion zone in the form of a diverging stream having an axial region substantially comprised of air and relatively fine coal particles, the presence of coal particles in said axial region being caused by classification of the said particles resulting from recirculation of at least some of the coal generally in the upstream direction with respect to the axis of the fuel stream;

supplying a sufficient quantity of ignition energy to the coal in the axial region of the fuel stream to decompose the said coal particles and ignite the reactants in the coal;

causing the flame resulting from ignition of coal particles in the axial region of the fuel stream to propagate, the step of causing the flame to propagate including controlling the velocity of the fuel stream as a function of coal particle size and volatiles content;

verifying the presence of flame in the combustion zone; and

stabilizing the flame by establishing a flow of secondary air in the combustion zone and generally coaxially with the fuel stream subsequent to verification of the presence of flame.

4,241,674

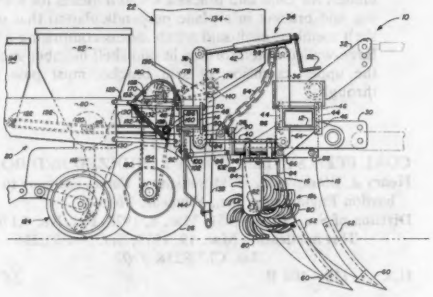
SUB-SOIL PLANTER

Paul B. Mellinger, Willow Street, Pa., assignor to Mellinger Manufacturing Co., Inc., Willow Street, Pa.

Filed Jan. 11, 1979, Ser. No. 2,652

Int. Cl.³ A01C *5/00*

U.S. Cl. 111—52 **16 Claims**



1. An improved agricultural machine for planting of row crops which combines at least three normal operations into one step; namely, sub-soiling the soil, tilling the soil that has been sub-soiled in preparing a seedbed, and planting seed in the prepared seedbed whereby soil compaction is reduced due to the combining of operations of three separate machines into one machine such that only one machine pass is required in performing the three operations and thus further resulting in savings of time and labor costs in a farming operation, said improved agricultural machine comprising:

(a) a front transverse tool bar adapted to be connected to a farm tractor for towing said machine across a field to be planted;

(b) a plurality of transversely spaced apart sub-soil blades mounted on said front tool bar and adapted to plow furrows in the subterranean soil as said machine is propelled forwardly over a field;

(c) a rear transverse tool bar spaced rearwardly of said front tool bar;

(d) first means for mounting said rear tool bar on said front tool bar such that said rear tool bar is free to float a predetermined distance upwardly and downwardly relative to said front tool bar during operation of said machine;

(e) a plurality of rotary tilling assemblies, corresponding to the number of sub-soil blades, disposed rearwardly the sub-soil blades for tilling the soil plowed by said sub-soil blades in thereby preparing a seedbed;

(f) a plurality of transversely spaced apart seed planter units, corresponding to the number of rotary tilling assemblies, disposed rearwardly of and in trailing relationship to said rotary tilling assemblies for

planting seed in said seedbed; and

(g) second means for mounting corresponding said rotary tilling assemblies and planter units of said rear tool bar such that a corresponding rotary tilling assembly and planter unit can moved in unison transversely along said rear tool bar so to facilitate transverse spacing of said planter units and said rotary tilling assemblies in desired predetermined crop row spacings.

4,241,675

MODULAR GAUGE PARTS ASSEMBLY FOR CUT/LOOP TUFTING MACHINES

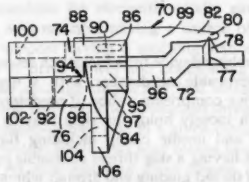
Harold B. Bardsley, Euxton, near Chorley, England, assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

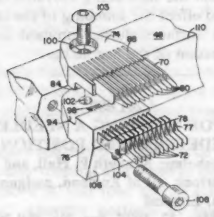
Filed Nov. 7, 1979, Ser. No. 91,977

Claims priority, application United Kingdom, Feb. 22, 1979, 6373/79

Int. Cl.³ D05C *15/36*

U.S. Cl. 112—79 A **8 Claims**





1. A modular assembly for supporting loopers and spring clips adapted for mounting in a tufting machine for producing cut and loop pile selectively, said assembly comprising, a plurality of loopers, each looper having a shank including a mounting portion at one end and a bill extending therefrom terminating in a nose, a first body member, said first body member having means for receiving and securing the mounting portion of said loopers in spaced side-by-side disposition, a plurality of spring clips, there being one clip for each looper, said clips having a shank including a mounting portion at one end and extending toward an offset flag, a second body member, said second body member having means for receiving and securing the mounting portions of said spring clips in spaced side-by-side disposition, the spacing between adjacent clips being substantially the same as the spacing between adjacent loopers, said first and second body members having means defining complementary reference surfaces disposed relative to the disposition of said loopers and said clips for co-operative engagement of said body members and for engagement of each flag resiliently with the nose of a respective looper, and means for securing said body members together as a unit in co-operative engagement.

4,241,676

TUFTING MACHINE LOOPER WITH CLIP

Ronald Parsons, Blackburn, and Ian Slattery, Great Harwood, near Blackburn, both of England, assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Nov. 7, 1979, Ser. No. 91,982

Claims priority, application United Kingdom, Nov. 16, 1978, 44857/78

Int. Cl.³ D05C *15/36*

U.S. Cl. 112—79 A **6 Claims**

1. In combination, a hook and spring clip for use in a tufting machine, said hook being planar and comprising a shank having a mounting portion and a bill extending therefrom to define a throat therebetween, said bill having a top edge and a bottom edge extending from said throat to form a nose, said spring clip having one end secured to the shank and extending to a free end through an intermediate portion generally in spaced parallel relation to said bill, a flag adjacent the free end resiliently engaging said nose at one face of said hook, said flag being defined by a pair of webs converging at a crease in said clip, a first of said webs extending toward said free end, the other of said webs extending toward said intermediate portion and merging into said intermediate portion at an angle, said intermediate portion being disposed beneath said bill and spaced out of the plane of said one face of said hook engaged by said flag toward the other face of said hook.

4,241,677

TWO NEEDLE SEWING MACHINE

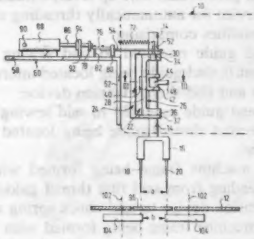
Alfons Beisler, Goldbach, Fed. Rep. of Germany, assignor to Velva AG, Locarno-Muralto, Switzerland

Continuation-in-part of Ser. No. 858,356, Dec. 12, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,460

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655283

Int. Cl.³ D05B *1/08*

U.S. Cl. 112—167 **9 Claims**



1. A two-needle sewing machine comprising: a needle-bar drive, a needle bar coupled to the needle-bar drive and being reciprocable in the direction of its longitudinal axis and having two needles arranged spaced disposition as to each other, a holder for the needle bar for guiding the same upon its reciprocating motion, a sewing table having passage apertures for the needles, two rotary grippers arranged underneath the sewing table and being rotative about axes parallel to the longitudinal axis of the needle bar, the rotary grippers being spaced apart a distance slightly less than the spacing of the needles from each other, the needle bar (14) being guided in a torsionally-fast manner in the holder (26), the holder (26) being adjustable about the longitudinal axis of the needle bar between a normal position (A—A), in which a needle plane extending through both needles (18,20) is directed substantially perpendicular to the feed direction (E) of the goods to be sewn, and at least one oblique position (B—B, C—C) having the needle plane directed obliquely to the feed direction (E), and in that the passage apertures are formed by slotted holes (98) which are curved in circular-arc-shaped manner about the longitudinal

axis of the needle bar and the length of which corresponds, in the angle extent to the adjusting angles (α, β) of holder (26).

4,241,678

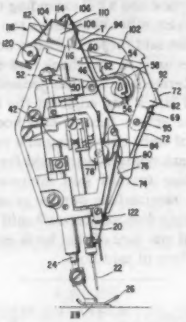
DEVICE FOR AUTOMATICALLY THREADING A SEWING MACHINE

Edward J. Tullman, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 23, 1979, Ser. No. 69,133

Int. Cl.³ D05B *47/00*

U.S. Cl. 112—225 **9 Claims**



1. In a sewing machine having a frame; various stitch forming instrumentalities including a thread tension device, an endwise reciprocatory needle bar carried within said frame, a take-up lever pivotally mounted within said frame for oscillation in a substantially vertical path in cooperative arrangement with said needle bar, and a check spring assembly for cushioning the effects of said take-up lever; actuating mechanisms for imparting endwise reciprocation to said needle bar and oscillation in said vertical path to said take-up lever; a thread supply; and a threading device for automatically threading said stitch forming instrumentalities comprising:

a. a first thread guide mounted to said sewing machine frame, said first thread guide being located intermediate a thread supply and said thread tension device;

b. a second thread guide mounted to said sewing machine frame, said second thread guide being located adjacent said needle bar;

c. said sewing machine frame being formed with a first thread path leading from said first thread guide through said thread tension device to said check spring assembly;

d. said sewing machine frame being formed with a second thread path leading from said first thread guide to said second thread guide, said first and said second thread paths intersecting one to the other at said check spring assembly;

e. said take-up lever having an uppermost edge and being formed with a thread carrying eyelet in one end thereof and a threading slot intersecting said thread carrying eyelet and extending to an opening in said uppermost edge;

f. guiding means for guiding thread into said threading slot in said take-up lever;

g. means for forming a loop of thread in said thread supply between said first and said second thread guides;

h. means for urging a first part of said loop of thread into said first thread path from said first thread guide, through said tension device and under said check spring assembly; and

i. means for urging a second part of said loop of thread into said second thread path from said check spring assembly through said take-up lever guiding means and to said second thread guide, whereby the thread from said thread supply will pass through said first thread guide, through said tension device, under said check spring assembly, through said eyelet in said take-up lever, and through said second thread guide.

4,241,679

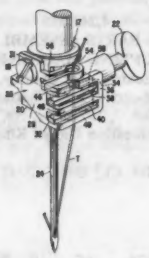
INERTIAL THREAD SNUBBING DEVICE FOR A SEWING MACHINE

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 7, 1980, Ser. No. 128,206

Int. Cl.³ D05B *47/04*

U.S. Cl. 112—255 **7 Claims**



1. A thread snubbing device for a lockstitch sewing machine including a reciprocable needle bar with a needle clamp thereon, said device comprising a shoe of predetermined mass and a cage which loosely holds the shoe next to the needle clamp, the shoe and needle clamp including flat opposing surfaces, the cage having a side thread accessible opening and the shoe having a thread guiding end around which the thread may be led into a position between the opposing surfaces on the shoe and clamp, the shoe and cage being engagable along a sloping surface and the shoe being movable thereby toward the needle clamp to effect the snubbing of the thread between said opposing flat surfaces during upward acceleration or downward deceleration of the needle bar.

4,241,680

DEVICE FOR STOPPING A NEEDLE AT A PREDETERMINED POSITION

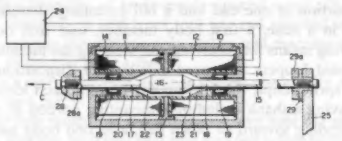
Peter G. Hinch, Rusholme; Kenneth F. Hall, and George Chambers, both of Martock, all of England, assignors to Newroyd Limited, Oldham, England

Filed Mar. 27, 1978, Ser. No. 890,384

Claims priority, application United Kingdom, Mar. 31, 1977, 13652/77

Int. Cl.³ D05B *69/22*

U.S. Cl. 112—275 **3 Claims**



1. A machine for making a textile product comprising a needle carrier shaft, a magnetically permeable core member which is mounted for reciprocating movement and which is drivingly connected to said needle carrier shaft to effect reciprocation of the latter, yarn feeding means for feeding a yarn to a needle carried by said shaft, two electromagnetic devices which are respectively disposed on opposite sides of the core member to effect reciprocation thereof, and an electrical control device which, on receiving a stop signal from a machine instructions means, permits reciprocation of the needle carrier

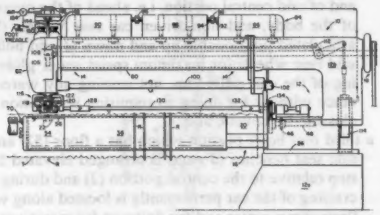
shaft to continue until the latter is at the said end of its reciprocation when a holding current from said electrical control device is passed to the respective electromagnetic device to hold the needle carrier shaft at the said end of its reciprocation.

4,241,681

TUBULAR WORK FEEDER FOR SEWING MACHINE

Robert E. Porter, 5 Oak St., Hamilton, Mass. 01982

Filed Jun. 21, 1979, Ser. No. 50,662
Int. Cl.³ D05B *27/10, 75/00, 65/00*
U.S. Cl. 112—322 **9 Claims**



1. In a machine for circumferentially stitching a tubular workpiece, said machine having a source of drive power, a workpiece support having a stitching station removed from said source of drive power and cooperating stitching needle means at said stitching station and feed means for feeding the portion of said workpiece to be stitched through said stitching station at a selected feed rate in a given direction of advancement, said needle means and feed means being operated synchronously by said source of drive power, the improvement comprising a tubular workpiece support of relatively great length and relatively small diameter and feeding system including:

a cylindrical drum of smaller diameter than said workpiece mounted for rotation upon said workpiece support and extending axially from a point adjacent said stitching station toward said source of drive power, the top of said drum parallel to its axis being aligned with said stitching station at right angles to said direction of advancement; and

first drive means connected to said source of drive power for synchronously rotating said drum to cause the top of said drum to move at said feed rate in said direction of advancement, whereby portions of said workpiece surrounding said drum near to and distant from said stitching station are conveyed over the workpiece support at said feed rate.

4,241,682

SOLUTIONS OF POLYETHYLENIMINE OR A HYDROPHILIC DERIVATIVE THEREOF AND A HYDROPHILIC ACRYLIC POLYMER AND WATERCRAFT COATED BELOW THE WATERLINE THEREWITH

Felix Konstandt, Jamaica, N.Y., assignor to Milton K. Rubin, Mt. Vernon, N.Y.

Continuation of Ser. No. 390,657, Aug. 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 212,732, Dec. 27, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 528,197
Int. Cl.² B63B *1/34*
U.S. Cl. 114—67 R **16 Claims**

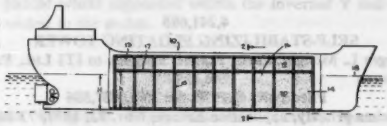
1. A watercraft having below its water line a coating comprising a mixture of a hydrophilic acrylic polymer and hydroxyethylated polyethylenimine prepared by reacting polyethylenimine of molecular weight 40,000 to 60,000 with ethylene oxide in a weight ratio of the polyethylenimine to the ethylene oxide of 1:0.1 to 1:1.

4,241,683

LIQUID CARGO TANK CONSTRUCTION

Charles S. Conway, Featherbed La., New Vernon, N.J. 07976

Continuation-in-part of Ser. No. 809,395, Jun. 23, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 913,956
Int. Cl.³ B63B *25/08*
U.S. Cl. 114—74 R **10 Claims**



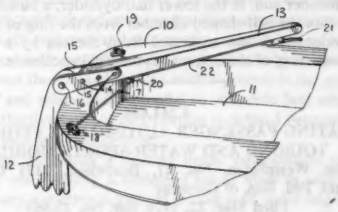
1. In a vessel disposed in water carrying a liquid having a specific gravity which is less than that of water, said vessel including a bottom, sides and a top forming at least one watertight compartment between said top and said bottom for carrying said liquid, the improvement comprising a watertight horizontal bulkhead disposed within said vessel between said top and said bottom at a distance above the waterline of said vessel which is approximately equal to $H(S_w/S_c-1)$, where H represents the vertical height of the waterline of the vessel above said bottom, S_w represents the specific gravity of water, and S_c represents the specific gravity of said liquid, said horizontal bulkhead forming separate upper and lower watertight tanks within said compartment above and below said waterline of said vessel, said upper one of said tanks having a vertical height which is less than that of said lower one of said tanks.

4,241,684

TILLER STEERING LOCK

Dan B. Davis, 5205 Belmore Ave., Montreal, Quebec, Canada (H4V 2C7)

Filed Jun. 1, 1979, Ser. No. 44,576
Int. Cl.³ B63H *25/52*
U.S. Cl. 114—144 R **5 Claims**



1. A quick release locking device to hold a tiller arm of a sailing boat in any desired position, the tiller arm connected at one end to a rudder rotating about a rudder axis, the device comprising

two rope attachment means, one at each side of the boat, positioned an equi-distance from the rudder axis,

rope locking means located on the underside of the tiller arm including two opposing cam detents, one cam detent pressing the rope against a restraining surface to grip the rope and prevent the tiller arm from moving in one direction, and the other cam detent pressing the rope against the restraining surface to grip the rope and prevent the tiller arm from moving in the other direction, spring means forcing each cam detent to press and grip the rope against the restraining surface,

flexible rope tautly strung between the two attachment means passing through the rope locking means,

quick release control lever located on the tiller arm, and

connection means between the control lever and the rope locking means and joining the spring means to the control

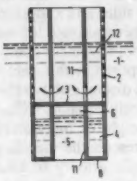
lever, the connection means adapted to retract the cam detents from pressing and gripping the rope such that depression of the control lever releases the rope from the rope locking means allowing the tiller arm to be rotated as desired, and release of the control lever grips the rope in the rope locking means preventing the tiller arm from rotating.

4,241,685

SELF-STABILIZING FLOATING TOWER

Georges L. Mougin, Paris, France, assignor to ITI Ltd., Paris, France

Filed Nov. 6, 1978, Ser. No. 957,886
Claims priority, application France, Nov. 22, 1977, 77 34980
Int. Cl.³ B63B *35/44*; B63G *35/00*
U.S. Cl. 114—264 **8 Claims**



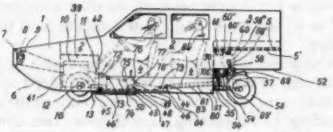
1. An offshore floating tower comprising
a vertical cylindrical external enclosure divided by a horizontal slab into two open-ended half-cylinders;
a lower half-cylinder comprising a ring of buoyancy tanks enclosing a bell-shaped chamber partially filled with air and producing partially pneumatic damping movement of the tower, and being ballasted to the required extent; and
an upper half-cylinder open to the sea with its entire surface comprising a regular pattern of perforations;
said tower including a vertical cylindrical internal enclosure coaxial with the vertical cylindrical exterior enclosure, constituted in the upper half-cylinder, an annular damper chamber and, in the lower half-cylinder, a bulkhead separating the bell-shaped chamber from the ring of buoyancy tanks which are separated from the sea by a bulkhead consisting of the external cylindrical enclosure.

4,241,686

FLOATING PASSENGER AUTOMOTIVE VEHICLE AS TOURING AND WATER-SPORTS MOBILE

Wilhelm Westphalen, No. 27, Bentwisch, 2171 Oberndorf (Oste), Fed. Rep. of Germany

Filed Mar. 22, 1979, Ser. No. 23,053
Int. Cl.³ B60F *3/00*
U.S. Cl. 440—59 **11 Claims**



1. A floatable passenger car for land and water cruising as touring and water sporting mobile and having an automobile engine which during water cruising is able to drive a boat propeller, comprising
(a) a special-type body of three sectional portions (1,2,3), namely
a first hollow light-weight front-structure bow portion (1) with a forwardly upwardly inclined wide floor (6),
a second body central portion (2) arranged adjacent to the front-structure bow portion and defining together with the same a gliding boat body with a gliding floor (44), said central portion including a bulkhead (51) at its rear end, seats for a driver and at least three persons which are to be occupied by these persons during road driving as well as when entering water as well as when leaving water, an automobile engine (10, 10', 10'') provided in the front part of said central portion in the longitudinal center thereof, drivable car front wheels (16,16') arranged to be moved up and down at both sides of the engine for the driver selectible driving of the front wheels via special-type change-over transmissions (11,104,104') and/or an up and down positionable propeller (82) placed behind the bulkhead (51) at the rear end of said central portion, i.e. ahead of the overall end of the body, and non-driven car rear wheels (53,53') articulated positionable up and down at said bulkhead, said rear wheels for maximum speed water glide cruising of the car, pulled up, not causing any water resistance without for doing so requiring installation boxes closable by covers, and
a third rear body portion which has a floor (52) and two side seat benches (5') and is arranged elevated by one step relative to the central portion (2) and during water cruising of the car permanently is located along with its floor above water and for doing so for maximum speed water glide cruising has its two side seat benches occupied with the same persons from the body central portion, by this human weight displacement the car being given a prevailing rear load for an advantageous maximum speed water glide cruising, said non-driven car rear wheels being accommodated in the most simple way underneath two side seat benches of the third rear body portion,
(b) chute-shaped body installation boxes (39) arranged in the central portion at both sides of the engine for accommodating the front wheels also pulled up during high-speed water glide cruising, said boxes being provided at their lower edges in a corresponding cutout in the gliding floor of the central portion and, after a complete insertion of the front wheels, are closable by plate slides shiftable forwardly underneath the gliding floor for the duration of high-speed water glide cruising of the car;
(c) a car accumulator battery (125'') arranged in the special-type body, and
(d) small reversible electric motors (38,61,61',97,50) and switches (125) electrically connected to the accumulator battery, the respective upward and downward positioning of the front wheels and the rear wheels and the propeller as well as the respective shifting of the plate slides underneath the front wheel installation boxes being accomplished by the small reversible electric motors powered by the car accumulator battery, controlled by means of respectively operated switches (125) by the driver from his seat.

4,241,687

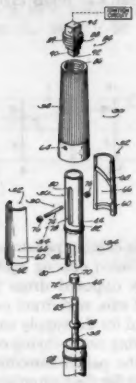
THROTTLE CONTROL FOR A MARINE PROPULSION DEVICE

Edmund H. DuBois, Zion, Ill.; Robert K. Erlandson, Kenosha, Wis., and Allan F. Miller, Lindenhurst, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 13, 1978, Ser. No. 959,890
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—63 **16 Claims**

1. A marine propulsion device comprising a marine propulsion unit including an engine having a throttle movable between an idle position for operating said engine at an idle speed and an advanced position for operating said engine at a speed above the idle speed, said marine propulsion unit further including a propeller rotatably mounted on said marine propulsion unit and operatively connected with said engine, a steering handle attached to said marine propulsion unit, throttle grip means attached to said steering handle for rotation relative

thereto in first and second opposite rotational directions, and throttle linkage means operatively connected with said throttle grip means and said throttle and movable axially of the axis of rotation of said throttle grip means for moving said throttle between said idle position and said advanced position in response to rotation of said throttle grip means, said throttle linkage means including first stop means for preventing rotation of said throttle grip means in the first rotational direction



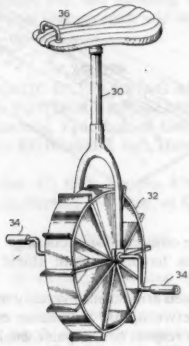
when said throttle is located in said idle position and second stop means for preventing rotation of said throttle grip means in the second rotational direction when said throttle is located in said advanced position, said throttle linkage means further including third stop means for selectively preventing rotation of said throttle grip means in the first rotational direction before said throttle reaches said idle position, notwithstanding said first stop means.

4,241,688

EXERCISING DEVICE FOR WATER USE

Ralph A. Mansolill, and Kathryn R. Mansolill, both of 1933 North Conference Dr., Boca Raton, Fla. 33452

Filed Dec. 21, 1978, Ser. No. 972,016
Int. Cl.³ B63B *35/72*
U.S. Cl. 440—26 **1 Claim**



1. An aid for exercising in a body of water to allow one to exercise in a seated upright position while sustaining the upper torso and head of the user out of the water, comprising:

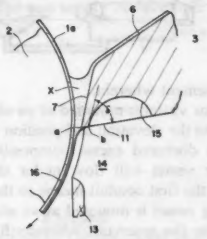
a one piece flexible inflatable buoyant body having a valve for inflation, said body having an enlarged (in volume) rear portion, a central, laterally recessed portion on each side for receiving the legs of a person straddling the body, and a forward portion having a reduced volume compared to the rear portion, the center of buoyancy being disposed behind the recessed areas toward the enlarged rear portion of the body, a handle connected to the forward upper surface of said body, a vertical shaft extending downward from the central portion of the bottom of the body and having an inverted Y on the bottom of said shaft, pedals on the lower extremities of the inverted Y, and a paddle wheel supported within the inverted Y and connected to the pedals.

4,241,689

COATING APPARATUS

Shigeru Kobayashi, Hino; Takemasa Namiki, Iruma, and Tsutomu Iwamoto, Hachiohji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,659
Claims priority, application Japan, Mar. 26, 1977, 52-33451
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—50 **6 Claims**



1. A coating apparatus comprising

means for moving downwardly a continuous web along a predetermined path;

a coating head positioned in the proximity of a downwardly moving portion of the web, said coating head having a slide face which defines a wedge-shaped space in cooperation with said web and said coating head having a bottom face extending substantially perpendicularly to said web adjacent thereto and formed with a groove in the proximity of and substantially parallel to said slide face whereby and effective bottom face portion is defined between said slide face and said groove;

means for supplying a coating liquid composition to said space and forming a sustained liquid mass in said space whereby a coating is applied to said web, including means for applying air pressure of an atmosphere plus 50 to 500 mm. Aq. to said coating on said web below said mass.

4,241,690

APPARATUS FOR COATING MOVING WEBS

Peter Muller, Port Washington, N.Y., assignor to Andrews Paper & Chemical Co., Inc., Port Washington, N.Y.

Filed Apr. 4, 1979, Ser. No. 27,164
Int. Cl.³ B05C *1/08, 11/06*
U.S. Cl. 118—63 **3 Claims**

1. In apparatus for coating a continuous, moving paper web with a liquid, said apparatus comprising;

means for passing the paper web from a first position to a second position;

a reservoir adapted to contain a liquid coating composition;

means associated with said reservoir, positioned between the first and second positions, for applying the liquid coating composition from the reservoir to the passing paper web;

means for doctoring excess composition applied to the paper web, positioned after the means for applying;

a collector vessel positioned beneath the means of doctoring

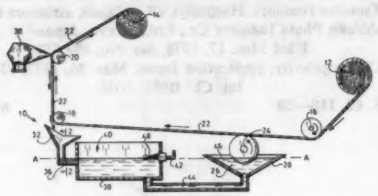
and adapted to collect excess composition doctored from the passing paper web;

a mixing vessel adapted to receive and mix liquid compositions;

first conduit means connecting the collector vessel with the mixing vessel and providing liquid communication between said vessels;

means for introducting make-up liquid composition into the mixing vessel; and

second conduit means between the mixing vessel and the reservoir, providing liquid communication between the mixing vessel and said reservoir;



the improvement wherein;

the collector vessel is mounted at an elevation and position relative to the elevation and position of the mixing vessel, whereby doctored excess composition collected in the collector vessel will flow under the force of gravity through the first conduit means to the mixing vessel; and

said mixing vessel is mounted at an elevation and position relative to the reservoir, whereby liquid composition in the mixing vessel will flow under the force of gravity to the reservoir through the second conduit means.

4,241,691

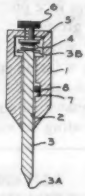
DOCTOR BLADE HOLDER

Harold H. Hopfe, Longmeadow; Robert H. Mosher, West Springfield, both of Mass., and Lawrence R. Sedgeley, Manchester, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 30, 1978, Ser. No. 938,178

Int. Cl.³ B05C *11/02*

U.S. Cl. 118—126 **6 Claims**



1. A doctor blade holder comprising a body member having a slot adapted to receive a doctor blade in a slidable fit within the slot with the doctoring edge of the blade projecting from the open end of the slot said holder being provided with:

A. a resilient means, disposed within the slot, adapted to bias a doctor blade retained within the slot away from the closed end of the slot;

B. a groove located in one wall of the slot running parallel to the closed end of the slot; and

C. a squirmer located within said groove so as to press resiliently against the surface of a doctor blade placed within the slot and restrict the movement of such a blade in a direction perpendicular to the sides of the slot but permit movement of such a blade in response to compression or expansion of the resilient means.

4,241,692

COATING DRUM

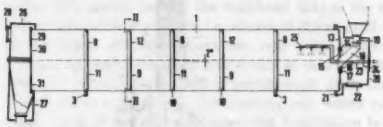
Willy H. P. Van Hijfte, Assenede, and Rafaël A. J. Goethals, Ertvelde, both of Belgium, assignors to Compagnie Neerlandaise de l'Azote, Brussels, Belgium

Filed Apr. 20, 1978, Ser. No. 898,330

Claims priority, application Netherlands, Apr. 28, 1977, 7704687

Int. Cl.³ B05B *13/00*

U.S. Cl. 118—303 **6 Claims**



1. An apparatus for coating pellets, such as prills, granules and the like, with a liquid coating agent, which comprises a cylindrical, obliquely disposed drum arranged for rotation about its longitudinal axis, said drum comprising means at or adjacent its higher end for the supply and input of pellets to be coated and for supplying and spraying or atomizing said liquid coating agent over the pellets introduced, and means at or adjacent its lower end for the output and discharge of coated product pellets, said apparatus being characterized by partitions arranged transversely to the axis of rotation and dividing the drum into compartments, each of said partitions having a passage opening located eccentrically relative to the axis of rotation and so that the passage openings in each pair of partitions defining a compartment are peripherally offset relatively to each other.

4,241,693

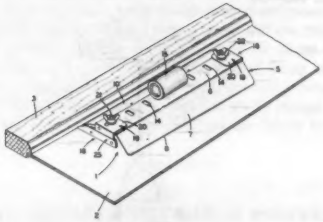
PAINT GUIDE

Allen M. Shotwell, 207 Simpson-Howell Rd., Elizabeth, Allegheny County, Pa. 15037

Filed Dec. 31, 1979, Ser. No. 108,809

Int. Cl.³ B05C *11/00*

U.S. Cl. 118—504 **15 Claims**



1. A paint guide construction including:

(a) frame means having a paint shield terminating in a straight edge;

(b) a pair of spaced arm means movably mounting the frame means therebetween, said arm means extending generally laterally with respect to the paint shield edge and terminating in front locating ends;

(c) spring means engageable with the frame means and arm means, biasing the paint shield toward a raised position wherein the straight edge is disengaged from a surface to be painted;

(d) link means operatively engageable with and extending between the frame means and arm means to impart straight line movement to the straight edge when said edge is moved toward or away from said surface; and

(e) pin means extending between the arm means and frame means, pivotally movably mounting the frame means on the arm means.

4,241,694

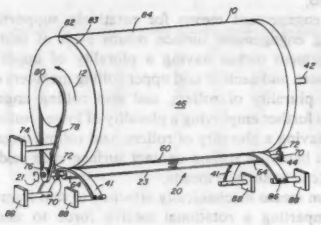
METERING ROLL WITH FIXED SLIDER STRIPS

Raymond G. Cormier, Nashua, and Leo O. Lutz, Hollis, both of N.H., assignors to Nashua Corporation, Nashua, N.H.

Filed Jul. 9, 1979, Ser. No. 56,127

Int. Cl.³ B05C *1/08*

U.S. Cl. 118—647 **6 Claims**



1. In a copying apparatus having

a rotating drum having a reusable photosensitive surface,

a developing station for contacting liquid toner to said drum surface to develop an electrostatic image, and

a transfer station for transferring said developed image to a transfer material,

apparatus for controlling the thickness of said liquid toner on said drum prior to said transfer station, comprising:

a metering roll,

means for biasing said metering roll toward said drum, and

means for controlling the minimum distance from said drum surface to said metering roll comprising:

a strip member,

means for securing said strip member between said drum surface and an end portion of said metering roll and perpendicularly to an axis of rotation of said drum, said securing means maintaining at least one end of said strip member in fixed position,

said strip member having first and second surfaces,

said drum surface being in sliding frictional contact with said first surface and said metering roll end being in sliding, frictional contact with said second surface.

4,241,695

ELECTROSTATIC DEVELOPING APPARATUS INCLUDING POWDER PROPELLING MEANS

Werner Salger, Hamburg, Fed. Rep. of Germany, assignor to Lumoprint Zindler KG (GmbH & Co.), Hamburg, Fed. Rep. of Germany

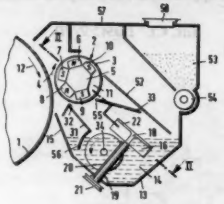
Filed Jan. 17, 1978, Ser. No. 870,226

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721424

Int. Cl.³ G03G *15/09*

U.S. Cl. 118—658 **23 Claims**

1. Electrostatic developing apparatus comprising: latent image carrier means; means defining a reservoir containing a supply of developer powder, said reservoir being arranged to have said powder supply normally contained therein not to exceed a maximum upper level; magnet cylinder means including a longitudinal axis and mounted proximate said latent image carrier means and located above said maximum upper level of said developer powder operative to entrain said developer powder to assist in bringing said powder into operative proximity with said latent image carrier means; and scoop wheel means including at least one scoop wheel and means for rotating said at least one scoop wheel about a scoop wheel axis, said scoop wheel axis being defined to extend at an angle with respect to the horizontal and transversely relative to the axis of said magnetic cylinder means, with said scoop wheel arranged to rotate about said scoop wheel axis within a plane extending toward said magnet cylinder means and generally parallel to



the axis thereof; said scoop wheel means being arranged relative to said maximum upper level of said developer powder in said reservoir such that at least part of said scoop wheel is maintained immersed in said supply of developer powder.

4,241,696

APPARATUS FOR DETECTING TONER CONCENTRATION

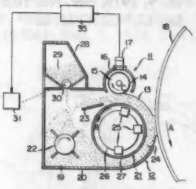
Norihito Huzii, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 12, 1979, Ser. No. 29,533

Claims priority, application Japan, Apr. 19, 1978, 53-51604[U]

Int. Cl.³ B05C *19/00*; G03G *15/09*

U.S. Cl. 118—691 **2 Claims**



1. A toner concentration detecting apparatus comprising a rotatable probe having a toner-receiving face located in contact with a magnetic brush of a developing mechanism and adapted to separate toner particles from a developer and to receive the same; a case housing the rotatable probe; means attached to the case for detecting an amount of toner on the toner-receiving face of the rotatable probe, said means including a light-emitting element for applying light to the toner-receiving face and a light-receiving element for receiving the light reflected by the toner-receiving face and converting the light into an electric signal; and a stray toner discharging port formed in the case, extending in the direction in which acts centrifugal force generated by the rotation of the probe and located near the light-emitting and light-receiving elements and inside said case housing so that stray toner particles are discharged from said case through said port.

4,241,697

LAMINATING DEVICE

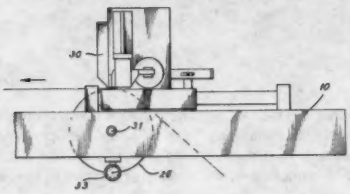
Helmut A. Friz, Stuttgart, Fed. Rep. of Germany, assignor to Paliv AG, Chur, Switzerland

Filed May 15, 1978, Ser. No. 906,124

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722593

Int. Cl.³ B05C *9/10*

U.S. Cl. 118—713 **24 Claims**



1. A laminating apparatus for applying a coating to a web of sheet material wherein the web is drawn between an elongated doctor blade and an elongated bearing surface, said doctor blade and bearing surface being carried by a supporting framework for relative vertical movement whereby to vary the thickness of the applied coating, characterized in that said bearing surface has a convex curvature and in that means are provided for mounting said bearing surface on the supporting framework for vertical adjustment.

4,241,698

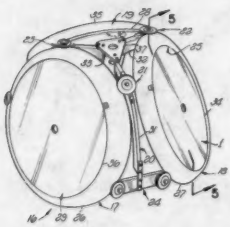
VACUUM EVAPORATION SYSTEM FOR THE DEPOSITION OF A THIN EVAPORATED LAYER HAVING A HIGH DEGREE OF UNIFORMITY

George Vitale, Torrance, Calif., assignor to MCA Discovision, Inc., Universal City, Calif.

Filed Feb. 9, 1979, Ser. No. 10,578

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—730 **5 Claims**



1. A vacuum evaporation system for forming a thin evaporated layer on a plurality of substrate members as said substrate members rotate about their central axis within a housing enclosing a plurality of substrates and a plurality of substrate carrier rings, said system comprising:

a carrier support track;

rolling engagement surface means for rotatively supporting a plurality of substrate members, which rolling engagement surface means employs a plurality of substantially circular members having a first surface and a second surface, said first surface providing an area of rolling contact with said carrier support track, said second surface having each of said substrate members disposed within a recess provided in said second surface and supporting said substrate members about their outer periphery;

frame means for supporting said rolling engagement surface means, which frame means employs a plurality of frame members, each of said frame members having a first end portion, said first end portion being primarily coplanar with and mechanically conjoined to each of the other said first end portion, each of said frame members extending away from said first end portions in an arc describing segments of great circles, said frame means including a plurality of roller engagement means rotatably connected thereto;

rolling engagement means for rotatively supporting said rolling engagement surface means each of said rolling engagement means having a plurality of upper rolling members, and each of said upper rolling members employing a plurality of rollers, and said rolling engagement means further employing a plurality of lower rolling members having a plurality of rollers, said rolling engagement means having a rolling contact surface with said rolling engagement surface means;

drive arm means mechanically attached to said frame means for imparting a rotational motive force to said frame means, and

drive means contacting said drive arm means for providing rotational movement between said rolling engagement surface and said rolling contact surface.

4,241,699

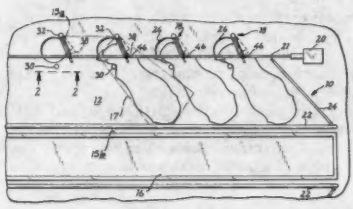
COW-RESTRAINING DEVICE

Paul D. Orchard, P.O. Box 74, Arago Station, Myrtle Point, Oreg. 97458

Filed Mar. 30, 1979, Ser. No. 25,491

Int. Cl.³ A01K *1/12*

U.S. Cl. 119—14.03 **5 Claims**



1. A walk-through cow milking parlor comprising

an elongate milking area,

an elongate walk-through stall having one and another sides adjacent and spaced from said area, respectively, extending substantially parallel thereto,

a plurality of cow-restraining devices, one for each cow, arranged, along said stall's other side for restraining cows at longitudinally spaced positions therealong,

each of said devices including an upright fixed-position bar, and an upright locking bar including a locking portion which is shiftable, relative to the fixed-position bar, toward and away from a restraining position, wherein said bars are positioned, adjacent opposite sides of the neck of a cow, to prevent withdrawal of the cow's head from between the bars, and wherein said bars are oriented to urge the cow toward a region of the stall extending between, and inclined with respect to, said stall sides,

elongate fence means extending along and positioned adjacent said stall's side to prevent cow movement beyond said fence means, toward said milking area, and

means operatively connected to said locking bars for moving

said locking portions, in unison, toward and away from their said restraining positions.

4,241,700

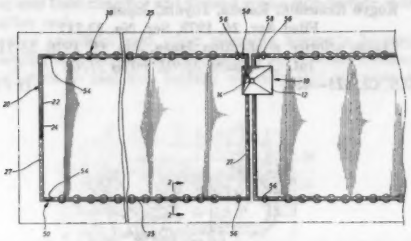
METHOD AND APPARATUS FOR SIMULTANEOUS DISTRIBUTION OF POULTRY FEED

Richard H. Cobb, Rte. 4, Box 330RC, Hope, Ark. 71801

Filed Jan. 19, 1979, Ser. No. 5,028

Int. Cl.³ A01K *5/00, 5/02*

U.S. Cl. 119—52 AF **8 Claims**



8. In a method of depositing poultry feed at a plurality of feed stations within a poultry house, the steps of:

(a) dispensing poultry feed into a trough from a feed source, the trough extending from the feed source through the poultry house in a closed loop to overlie a plurality of selectively positioned feed stations, with the trough having an opening therein at each of the feed stations;

(b) conveying the poultry feed along the feed trough from the point of dispensing past the different feed stations without dispensing feed through the trough opening at those stations by covering the trough openings with respective gates, and achieving an essentially uniform distribution of feed in the trough along the length of the closed loop;

(c) sensing the level of the poultry feed at a position adjacent the feed trough at the distant end of the closed loop trough when the poultry feed reaches a desired level;

(d) after the completion of step (b) and in response to step (c), simultaneously, axially displacing each of the gates by at least one cable interconnected to a plurality of gates, and depositing essentially identical amounts of feed from the trough to the plurality of feed stations to provide simultaneous and uniform feed distribution throughout the poultry house, by conveying feed from positions between the openings to the openings for dispensing to the feed stations.

4,241,701

METHOD AND APPARATUS FOR CONTROLLING STEAM TEMPERATURE AT A BOILER OUTLET

Richard H. Morse, Oreland, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Feb. 16, 1979, Ser. No. 12,633

Int. Cl.³ F22G *5/00*

U.S. Cl. 122—460 **5 Claims**

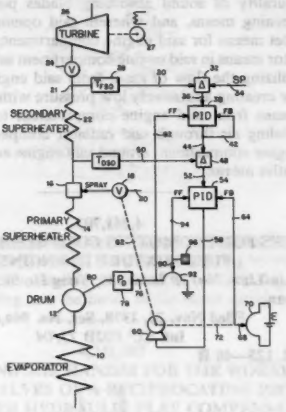
2. In a drum type boiler having a superheater and a control system for modifying the operation of said boiler to control the temperature of the steam at the outlet of said superheater wherein the control system includes a controller responsive to the difference between said outlet temperature and its set point for controlling the outlet temperature, the improvement which comprises:

means for producing a feedforward signal proportional to the drum pressure in the boiler; and

means for applying said feedforward signal to said controller in such sense as to modify the control so as to tend to minimize changes in the temperature at said outlet due solely to drum pressure changes.

5. A method for controlling the temperature of the steam at the outlet of the superheater of a drum type boiler operating in the sliding pressure mode, comprising the steps of:

automatically controlling the fluid distribution or the heat distribution in the boiler in response to the deviation of outlet temperature from its set point so as to tend to maintain said outlet temperature at its set point; and



modifying said control in response to the magnitude of a feedforward signal proportional to the pressure of the steam in said drum, said modification being in sense to tend to reduce the temperature change expected solely as a result of changes in drum pressure.

4,241,702

NOISE-PROOF AND AIR-COOLED ENCLOSURE FOR AN ENGINE

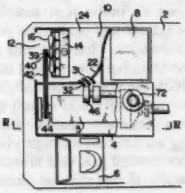
Sadatoshi Takeuchi; Akio Iida, both of Kawasaki; Kimio Miyake, Yokohama, and Mitsuhisa Sakae, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 7, 1977, Ser. No. 858,394

Claims priority, application Japan, Dec. 7, 1976, 51-163060; Dec. 7, 1976, 51-163061; Dec. 7, 1976, 51-163062; Dec. 7, 1976, 51-163064

Int. Cl.³ F01P *1/02*

U.S. Cl. 123—41.7 **6 Claims**



1. A vehicle having a noise-proof and air-cooled enclosure system comprising a vehicle frame;

an engine supportably mounted on said frame having an exhaust pipe thereon;

a radiator for cooling said engine, mounted on said frame, said radiator being arranged sideways with respect to said engine;

a radiator compartment having an inlet and an outlet for cooling air, said radiator compartment enclosing said radiator;

a closed engine compartment positioned adjacent said radiator compartment and having inlet means and outlet means

for cooling air said engine compartment enclosing said engine;

a partition wall for separating said engine compartment from said radiator compartment, said partition wall having an opening means for communicating between said compartments said opening means including sound absorbing means wherein said sound absorbing means includes a plurality of sound absorbing blades positioned in said opening means, and wherein said opening means is the inlet means for said engine compartment; and

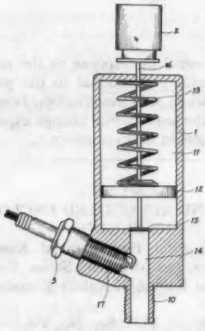
ejector means in said engine compartment said ejector means utilizing the flow of gases from said engine exhaust pipe for creating a relatively low pressure within said air outlet means from said engine compartment to draw ambient cooling air through said radiator compartment into said engine compartment around said engine and out of said air outlet means.

4,241,703

DEVICES FOR PROMOTING COMPRESSION RATIO OF FUEL MIXTURE IN ENGINES

Jiing Lin-Liaw, No. 18 Lane 136, Yung Ho St., Taichung City, Taiwan

Filed Nov. 22, 1978, Ser. No. 964,448
Int. Cl.³ F02B 75/04
U.S. Cl. 123—48 R **9 Claims**



1. A device for fitting in a first socket communicating with a combustion space of an internal combustion engine for increasing the gas pressure in said combustion space when a fuel air mixture is combusted therein, said first socket being adapted to removably receive a combustion assisting member; said combustion space being defined between a portion of the internal surface of a combustion chamber and a power member sealingly fitted in the chamber for cyclical movement between a first position in which the volume of said combustion space is a minimum and a second position in which the volume of said combustion space is a minimum; said device comprising

a housing defining an internal storage chamber for storing high pressure combusted gas, said housing having a portal formed in the walls of said storage chamber, said housing including an appendage having an outer surface adapted to be fitted into said first socket, a passage being formed in said appendage, one end of said passage terminating at said portal, the other end of said passage communicating with said combustion space; said appendage having a second socket formed therein for receiving said combustion assisting member so that said combustion assisting member communicates with said passage; and

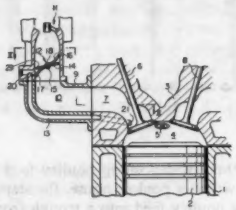
valve means for opening said portal when said power member is in said first position before combustion of said fuel air mixture to permit said high pressure combusted gas to flow into said combustion space to increase the total pressure in said combustion space during combustion of said fuel air mixture and for permitting said high pressure combusted gas to flow from said combustion space into said storage space immediately after said combustion, and for closing said portal after said combustion to trap said high pressure combusted gas in said storage chamber when said power member is moving between said first and second positions.

4,241,704

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Yasuhiko Ishida, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 26, 1979, Ser. No. 33,517
Claims priority, application Japan, Jun. 15, 1978, 53-71536
Int. Cl.³ F02M 23/02; F02B 31/00
U.S. Cl. 123—432 **11 Claims**



1. An internal combustion engine having a combustion chamber and an intake valve, said engine comprising:

a main intake passage having an inlet and connected to the combustion chamber via the intake valve;

fuel supply means arranged in the inlet of said main intake passage and having a rotatable valve shaft and a valve body which is fixed onto said valve shaft and has a front face and a rear face, said valve body having a shape which is approximately equal to that of the cross-section of said main intake passage;

a deformable valve plate comprising an inner end fixed onto the rear face of said valve body, and a peripheral outer edge normally projecting outwardly from a peripheral outer edge of said valve body and having a contour capable of establishing the sealing contact between the peripheral outer edge of said valve plate and an inner wall of said main intake passage when the opening degree of said valve body is reduced below a predetermined degree, said valve plate being arranged to be normally in contact with the rear face of said valve body and being bent to form a valve space between said valve body and said valve plate when the opening degree of said valve body is reduced below said predetermined degree; and

an auxiliary intake passage having an outlet and an inlet arranged in the vicinity of said valve body at a position wherein said inlet is normally in communication with said main intake passage located upstream of said valve body and is in communication with said valve space when the opening degree of said valve body is reduced below said predetermined degree, the outlet of said auxiliary intake passage being connected to said main intake passage located downstream of said valve body.

4,241,705

VARIABLE COMPRESSION RATIO PISTON

Albert M. Karaba; Brian C. Kauffman, and Glen L. Bowen, all of Muskegon, Mich., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

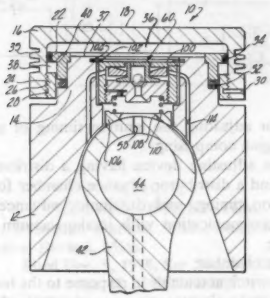
Filed Jul. 27, 1978, Ser. No. 928,363
Int. Cl.³ F02B 75/04
U.S. Cl. 123—78 B **11 Claims**

1. In an internal combustion engine, a piston having an inner

member and an outer member telescopically received by said inner member, said members being movable in response to reciprocation of the piston with respect to a combustion chamber of the engine, said members forming a fluid chamber therebetween, said fluid chamber varying in volume in response to said relative movement and to variations in the quantity of fluid therein, and means for supplying fluid to said chamber, said means comprising a supply passage in said piston connecting with said fluid chamber, and a discharge passage connected with said fluid chamber and with the crankcase of said engine, the improvement which comprises:

a bore formed in said piston inner member open at one end to said fluid chamber and formed with a stop surface at its other end;

a valve assembly, said valve assembly having a housing wholly inserted into said bore in the piston inner member adjacent to said stop surface whereby said assembly is



removable and accessible solely from said one end of said bore by removal of said outer member;

a one way inlet valve contained in said housing and in said supply passage;

a normally closed valve contained within said housing and in said discharge passage, said normally closed valve being operable upon a predetermined pressure in said fluid chamber to open and thereby permit fluid to discharge from said fluid chamber and into the crankcase; and

means for detachably locking said valve assembly housing in said piston inner member bore, wherein said detachable locking means comprises a retainer means removably mounted in said piston inner member bore about the top thereof, said retainer means including a portion which extends over said valve assembly housing to retain said valve assembly housing within said piston inner member bore.

4,241,706

VALVE ROTATOR ASSEMBLY

Shinichi Shimada, Kamifukuoka, and Takenori Makino, Okegawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

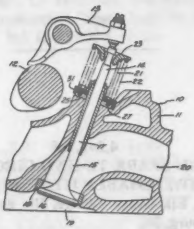
Division of Ser. No. 847,231, Oct. 31, 1977. This application May 8, 1979, Ser. No. 37,035

Claims priority, application Japan, Nov. 11, 1976, 51-150610; Dec. 2, 1976, 51-160476

Int. Cl.[2] F01L *1/32*

U.S. Cl. 123—90.3 **1 Claim**

1. For use with a poppet valve assembly for a combustion chamber of an internal combustion engine, said assembly including a poppet valve having a stem, a pair of concentric coil compression springs encircling a portion of the stem and a retainer removably attached to the valve stem and contacted by the upper end of each spring, the improvement comprising, in combination: a stationary support member encircling the valve stem and having a concentric upward facing continuous groove therein, a garter spring in said groove and projecting slightly out of the groove, an annular rotator plate engaging said garter spring, and a retainer ring resting on said rotator plate and providing an upward facing shoulder for supporting the lower end of each of said coil springs at the same elevation,



said retainer ring having integral fingers projecting therefrom contacting the lower end of the outer coil spring to hold it in concentric position, the fingers extending between the outside of the inner spring and the inside of the outer spring.

4,241,707

ACTIVATING MECHANISM FOR THE WORKING MEDIUM VALVES OF A RECIPROCATING PISTON ENGINE WITH HYDRAULIC PLAY COMPENSATING ELEMENTS

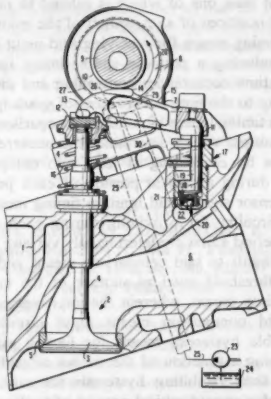
Bertold Mayr, Beutelsbach, and Siegfried Röser, Baltmannsweiler, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 4, 1975, Ser. No. 565,073

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1974, 2416910

Int. Cl.[3] F01L *1/14, 1/24*

U.S. Cl. 123—90.55 **8 Claims**



1. An actuating installation for working medium valve means in a reciprocating engine, which includes an oil circulatory system, at least one cam shaft and one cam means each for each valve means and at least an indirect actuation of the valve means by the corresponding cam means, and hydraulic play-compensating means which are provided with working space means filled with lubricating oil, characterized in that the place of the hydraulic connection of the play-compensating means with the oil circulatory system is located at such a place in said circulatory system at which the oil circulatory system possesses a pressure which lies in all operating conditions below the feed pressure of the circulatory system but above the atmo-

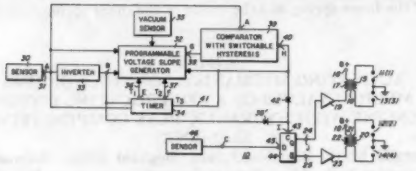
spheric air pressure of the reciprocating engine, and in that the hydraulic play-compensating means are arranged at a place where the actuating reaction forces are transmitted into an engine frame.

4,241,708

IGNITION SPARK TIMING CIRCUIT WITH SWITCHABLE HYSTERESIS

Rupin J. Javeri, Elk Grove Village, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1979, Ser. No. 29,505
Int. Cl.³ F02P 5/04
U.S. Cl. 123—418 **8 Claims**



1. An ignition spark timing circuit for an internal combustion engine, comprising:

sensor means for providing a periodic input sensor signal having a frequency and period proportional to the speed of an engine, the input sensor having leading and trailing edges at least one of which is related to predetermined angular positions of a crankshaft of the engine; and

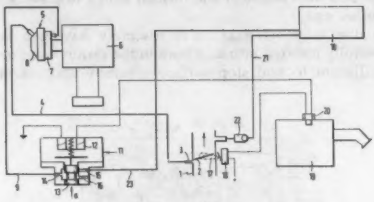
ignition timing means for receiving said input sensor signal and producing a periodic spark timing ignition signal having time occurrences controlling and directly corresponding to the time occurrences of spark ignitions, said ignition timing means including a comparison means having an output which determines the occurrence of spark ignitions by comparing at least two comparison input signals during a critical portion of each period of said input sensor signal, said ignition timing means including input circuitry for providing during each input sensor signal period a first predeterminedly varying signal as one of the inputs to said comparison means and a predetermined threshold level as another of the inputs to said comparison means, wherein the improvement comprises that said comparison means input circuitry includes switchable hysteresis means for having said threshold level being a function of the output of said comparison means, thus exhibiting hysteresis for said comparison means, during said critical portion of each period of said input sensor signal and for having said threshold level being independent of the output of said comparison means during an other portion of each period of said input sensor signal, whereby substantial noise immunity is provided for said comparison means during the critical portions of said input sensor signal period during which said comparison means determines the occurrence of spark ignitions, while during the other portion of each period of said input sensor signal said comparison means is permitted to have an output independent threshold level which insures proper operation of said comparison means even when said predeterminedly varying signal has small peak amplitudes.

4,241,709

DEVICE FOR ADJUSTING THE IGNITION TIME IN INTERNAL COMBUSTION ENGINES

Klaus Schellmann, Hemmingen, and Heinz Schulze, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,501
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818469
Int. Cl.³ F02P 5/08, 5/10
U.S. Cl. 123—407 **9 Claims**



1. Device for adjusting the ignition timing of an internal combustion engine comprising:

(a) a vacuum adjusting device having a distributor retard chamber and a distributor advance chamber for controlling ignition timing, said distributor advance chamber being in communication with intake vacuum in an air intake line;

(b) a vacuum chamber;

(c) a thermoswitch actuatable in response to the temperature of engine intake air exceeding a predetermined value;

(d) a throttle valve switch actuatable in response to a flow regulator means in said air intake line assuming a full or high load range position; and

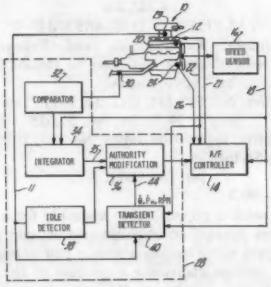
(e) control valve means for communicating said distributor retard chamber with ambient pressure in a first position thereof and for communicating said distributor retard chamber with said vacuum chamber upon conjoint actuation of both of said thermoswitch and throttle valve switch.

4,241,710

CLOSED LOOP SYSTEM

William A. Peterson, Jr., Rochester, and Roman O. Marchak, Northville, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 22, 1978, Ser. No. 918,180
Int. Cl.³ F02M 7/00
U.S. Cl. 123—440 **16 Claims**



1. A closed loop system for the control of the air/fuel ratio of an internal combustion engine comprising:

an air/fuel ratio controller for regulating the air/fuel ratio of

the internal combustion engine according to a calculation based upon a predetermined fuel schedule and the sensing of at least one operating parameter of the engine;

integral controller means for modifying said regulation of said air/fuel ratio controller with a closed loop correction signal wherein said controller means is responsive to the bi-level output of an exhaust gas sensor, said integral controller means incrementally increasing the air/fuel ratio of the engine when the sensor detects a rich condition and outputs a first level, said integral controller means incrementally decreasing the air/fuel ratio of the engine when the sensor detects a lean condition and outputs a second level; and

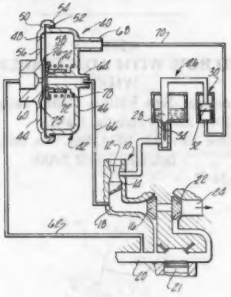
authority modification means for regulating the authority of said integral controller means between a maximum value and a minimum value dependently upon the absolute value of the magnitude of the system error.

4,241,711

FUEL CONTROL SYSTEM

Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Dec. 5, 1978, Ser. No. 966,616
Int. Cl.³ F02B *33/00*
U.S. Cl. 123—559 **5 Claims**



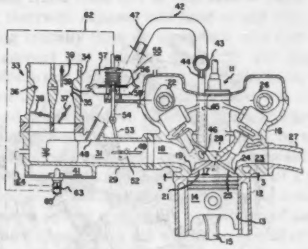
1. A fuel control system for an internal combustion engine induction system wherein combustion air and fuel is drawn from a carburetor through a compressor section of a turbo charger and into an intake manifold, the combination comprising; a pressure responsive fuel control means for delivering fuel to said carburetor, a housing including a diaphragm forming a regulating chamber at one side and a control chamber at the other side of said diaphragm, said regulating chamber being connected to a first source of pressure at a point upstream of said compressor and said control chamber being connected to a second source of pressure at a point downstream of said compressor, a passage communicating said fuel control means with said regulating chamber, valve means between said first source of pressure and said regulating chamber, said valve means including an opening communicating with said induction system upstream of said compressor, said diaphragm being movable into and out of engagement with said opening to close and open the latter, respectively, to control communication between said first source of pressure and said fuel control means in proportion to the pressure in said control chamber.

4,241,712

INDUCTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hiromitsu Matsumoto, Hamamatsu, Japan, assignor to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 13, 1978, Ser. No. 896,083
Claims priority, application Japan, Aug. 16, 1977, 52-97469
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—432 **24 Claims**



1. In an internal combustion engine having a substantially open variable volume chamber in which combustion occurs, a charge forming device for discharging fuel, a main intake passage served by said charge forming device and communicating with said chamber through a main intake port for delivering a charge therethrough, and a sub-intake passage served by said charge forming device communicating with the open portion of said chamber through a sub-intake port, said sub-intake passage having an effective cross-sectional area at substantially less than the effective cross-sectional area of said main intake passage for causing a given mass flow of charge through said sub-intake port to enter said chamber at a significantly greater velocity, said sub-intake port being disposed in close proximity to said open chamber so that the charge delivered to said open chamber through said sub-intake passage enters said chamber at substantially undiminished velocity, the improvement comprising temperature responsive means for controlling the ratio of the communication of said ports with said chamber during a given cycle operation of said engine for causing a greater portion of the flow to said chamber to pass through said sub-intake passage at low temperatures to minimize the likelihood of fuel condensation.

4,241,713

ROTARY INTERNAL COMBUSTION ENGINE

Melvin R. Crutchfield, 3804 N. 54th Pl., Phoenix, Ariz. 85013

Filed Jul. 10, 1978, Ser. No. 923,077
Int. Cl.³ F02B *53/00*
U.S. Cl. 123—202 **6 Claims**

1. A rotary vane internal combustion device comprising:

(a) a housing defining a cylindrical bore;

(b) a fixed shaft extending in said bore having a first section having its axial center line concentric with the center line of the cylindrical bore and having a second section radially offset from the axial center line of said bore;

(c) collar means rotative about said first shaft section within said bore;

(d) a rotor mounted for rotation in said bore about an axis eccentric with respect to the longitudinal center line of said cylindrical bore;

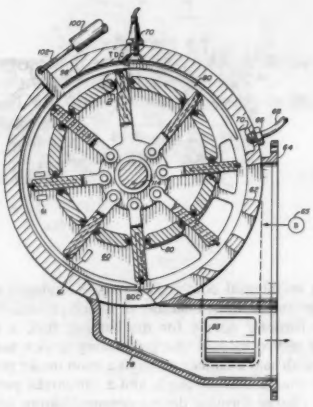
(e) power take-off means connected to said rotor concentric with said offset second shaft section;

(f) a plurality of vanes hingedly secured to said collar means rotative with said rotor about a rotational axis coaxial with the longitudinal center line of said bore;

(g) at least one vane fixedly secured to said collar means rotative with said rotor, said vanes, casing and rotor defining circumferential working chambers varying in volume

as the rotor and vanes rotate from a maximum volume at approximately BCD to a minimum volume at approximately TDC and then increasing to a maximum at approximately BDC in the rotative cycle, TDC and BDC being approximately 180° spaced apart in the cycle;

(h) intake and exhaust ports communicating with said chambers, said intake ports communicating with said working chambers substantially between BDC and TDC and said exhaust ports communicating with said working chambers substantially between TDC and BDC;



(i) control means including fuel delivery means located to directly deliver fuel intermediate the intake port and TDC to form a combustible A/F mixture in a chamber while maintaining a constant throughflow; and

(j) ignition means for igniting the combustible A/F mixture at approximately TDC whereby the theoretical thermodynamic cycle of operation is characterized by isentropic compression, constant volume combustion, isentropic expansion and constant pressure exhaust.

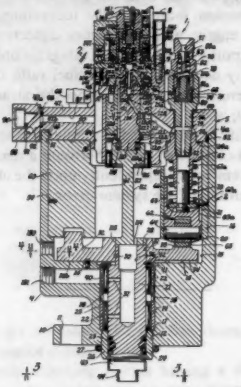
4,241,714

SOLENOID VALVE CONTROLLED FUEL INJECTION PUMP

Richard S. Knape, and Richard A. Moreau, both of Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 25, 1979, Ser. No. 51,887
Int. Cl.³ F02M *37/04*; F04B *49/00*
U.S. Cl. 123—499 **4 Claims**

1. A fuel injection pump comprising, in combination, a housing means having a central stepped bore defining a valve sleeve closely adjacent to one end of said housing means, a solenoid assembly fixed to and closing said one end of said housing means; a control valve rotatably journaled in said valve sleeve and positioned to define an annular fuel chamber with one end of said solenoid assembly; said housing means having a passage in communication at one end with said fuel chamber and connectable at its other end to a source of fuel, a plurality of pumping means equally circumferentially spaced around said bore; each of said pumping means having a pump chamber connected to a fuel passage in communication with said bore and to a valve controlled fuel discharge outlet means; and, a drive means journaled in the opposite end of said housing and operatively connected to said pumping means to effect sequential operation thereof and to said control valve for rotating said control valve; said control valve having a fuel control means thereon to form with said valve sleeve a supply chamber in communication with said fuel chamber and adapted to be placed in communication sequentially with each of said fuel passages, said control valve further having a spill passage means therein with one end thereof radially aligned for sequential communication with each of said fuel passages during rotation of said control valve and the opposite end thereof being positioned coaxial with said bore and operatively opening into said fuel chamber, said solenoid assembly having an armature and a separate valve actuated by said armature and positioned so as to control flow from said pump chambers via



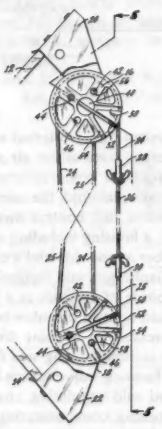
said spill passage means into said fuel chamber; said valve being journaled whereby it can rotate with said control valve, said valve being operative as controlled by said armature whereby both the amount of fuel discharged into each of such fuel discharge outlet means and the timing thereof is controlled by operation of said armature of said solenoid assembly to control spill flow out through said spill passage means.

4,241,715

COMPOUND BOW WITH ADJUSTABLE ECCENTRIC WHEEL

Thomas P. Jennings, Sun Valley, Calif., assignor to Jennings Compound Bow, Inc., Valencia, Calif.

Filed Nov. 17, 1978, Ser. No. 961,760
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—24 R **12 Claims**



1. In a compound bow having a center handle portion, upper and lower limbs having inner ends connected to the center portion and free outer ends, and upper and lower draw pulleys mounted for eccentric rotation respectively on the free outer

ends of the upper and lower limbs and with first and second draw cables each having one end secured to opposite limbs and each having a free end passing across the bow to the opposite limb and around one of the draw pulleys and with a bow string interconnecting the free ends of the first and second draw cables, the improvement comprising

each of the draw pulleys having a peripheral portion and a central portion,

first and second spaced grooves formed in and extending around the peripheral portion,

a path leading through the central portion and connecting the first and second grooves and with the path intersecting the first and second grooves at particular points,

the first draw cable passing into contact with and lying within the first groove in the peripheral portion and then passing along the path leading through the central portion and passing into contact with the second groove,

the second draw cable passing into contact with the first groove on the other draw pulley, and then passing along the path leading through the central portion and then passing into contact with the second groove, and

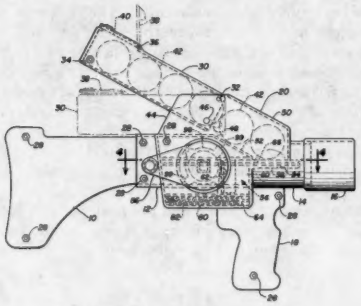
means for permitting variations of the point of intersection between the path and at least one of the first and second spaced grooves for adjusting the draw length and draw weight of the bow.

4,241,716

AUTOMATIC TOY GUN FOR PING PONG BALLS

Kwok W. Tsui, Hong Kong, Hong Kong, assignor to Arco Industries Ltd., Hong Kong, Hong Kong

Filed Feb. 12, 1979, Ser. No. 11,220
Int. Cl.³ F41B 7/00
U.S. Cl. 124—27 **3 Claims**



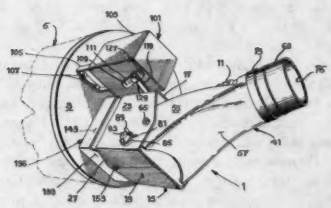
1. A toy gun simulating an automatic rifle adapted to shoot ping pong balls comprising in combination, an elongated frame comprising a pair of rigid molded complementary hollow shells which when connected along a common central plane define respectively: a shoulder stock at the rear end, a short cylindrical barrel at the forward end, a stationary supporting handle extending downward from said frame intermediately of the ends thereof, a portion of a magazine extending upward and rearward from said frame at an acute angle adjacent the rearward end of said barrel, the interior of said magazine being shaped and adapted to hold and control movement of a row of a limited number of ping pong balls, and means to secure said shells in mating relationship to define a hollow interior, the improvements comprising means pivotally connecting a supplemental magazine to said portion of a magazine in said frame adjacent the rearward end of said barrel to permit movement of said supplemental magazine between a depressed inoperative position substantially parallel to said frame and an elevated position in which it extends upward and rearward from said magazine portion and in axial alignment therewith, a firing ram supported by guide means for reciprocation within the interior of said frame and having a rod-like ball-engaging plunger on the forward end movable longitudinally in said frame between a retracted position and an extended firing position beneath said magazine portion of said frame and into said barrel and an actuating head on the rearward end of said firing ram provided with a straight slot perpendicular to the path of movement of said ram open at one side of said head, a crank rotatably supported by one side of said frame by a short cylindrical support extending from said crank and rotatable within a complementary cylindrical flange bearing wall extending laterally into the interior of said frame from one of said hollow shells thereof and integral therewith adjacent said head of said ram, a crank pin projecting laterally from an inner face of a disc on said cylindrical support and integral therewith and positioned within said slot in said head of said ram, said disc being fixed to the inner face of said short cylindrical support and overlying the rim of said bearing wall to retain said support operatively within said flange bearing, and a compression spring mounted within said frame and extending between a rearward wall in the interior of said frame and the lower portion of a forward part of said head on said ram and operable to be compressed when said ram is moved rearwardly by rotation of said crank and engagement of said crank pin with the rear wall of said slot and operable to project said ram forwardly when said crank pin is moved out of said slot incident to rotation of said crank, the upper end of said slot being below the upper zenith of rotational movement of said crank pin, whereby said slot is freed from said crank pin prior to said pin reaching said zenith of its movement.

4,241,717

OSCILLATING FLIGHT CONTROL DEVICE FOR A BALL PROJECTING MACHINE

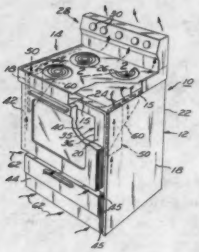
Maurice Mariani, 2285 rue St-Mathieu, app. 801, Montreal, Quebec, Canada (H3H 2S7)

Filed May 30, 1978, Ser. No. 911,038
Int. Cl.² F41D 9/00
U.S. Cl. 124—83 **9 Claims**



1. A device (as claimed in claim 1 including) for use with a ball projecting machine for controlling the flight of a ball projected from the machine through a flexible tube, said device comprising a first casing; means for pivotably mounting the first casing at one end to the machine for swinging movement about a generally upright axis; a second casing adjacent the other end of the first casing; means for pivotably mounting the second casing at its one adjacent end to the first casing for swinging movement about a generally horizontal axis; said first and second casings being adapted to carry the flexible tube of the ball projecting machine, said second casing having means at its other end for holding the outlet end of said flexible tube; and means for oscillating the first casing, and thus the second casing also, about the upright axis.

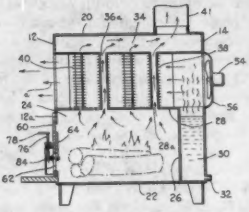
4,241,718
RANGE BODY COOLING SYSTEM
Eugene J. Barnett, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Apr. 3, 1978, Ser. No. 892,846
Int. Cl.³ F24C *15/32*
U.S. Cl. 126—21 R **3 Claims**



1. A free-standing convection-cooled domestic range of the pyrolytic self-cleaning type comprising:
an exterior housing having vertically extending front, rear, and opposite side walls;
a horizntal platform supported by at least said side walls, said platform having a perimetric edge adjacent the upper edges of at least said front and side walls;
a boxlike oven liner disposed within said housing walls and below said platform, said liner defining an oven cavity opening through an access aperture in said front wall, said liner being spaced from at least said side walls and said platform;
movable door means for closing access to said oven cavity;
heat sink means disposed between said side walls and said oven liner, said heat sink means being located generally adjacent said front wall and said platform, said heat sink means including a vertically extending, elongated, metallic channel member having a U-shaped horizontal plane cross section, said U-shaped cross section opening toward said rear wall and being defined in part by a pair of leg members spaced from each other,
air inlet means in said front wall, said air inlet means being disposed below said heat sink means at a downstream point, wherein air provided via said inlet means, when heated, moves upward by convection and contacts said heat sink means, said provided air moving out of contact with said heat sink means and being exhausted at a point above said heat sink means at an upstream point, and
flange means extending inwardly toward said liner, from the upper end of said side walls at least a portion of each of said flanges being disposed above said heat sink means and below said platform, said flange portion including apertures for passing at least a portion of said provided air from said heat sink means location to said outlet means, said portion of said provided air carrying heat from said heat sink means upwardly through the space between said pair of legs of said channel member and then through said apertures.

4,241,719
HEATER STOVE APPARATUS
Joseph K. Vickery, Rte. 2, Liberty, S.C. 29657
Filed Mar. 17, 1978, Ser. No. 887,500
Int. Cl.³ F24B *3/00*
U.S. Cl. 126—66 **13 Claims**

1. Heating stove apparatus comprising:
an enclosed stove housing;
a fire chamber within said housing in which a suitable fuel is burned for heating;
a draft door carried by said housing providing access to the interior of said fire chamber;
a heat collector manifold receiving the heat and combustion products from said fire chamber;
a plurality of elongated heat delivery pipes extending between said fire chamber and said heat manifold for delivery of heat and combustion products thereto, said heat pipes having open opposing ends communicating with the respective interiors of said fire chamber and heat manifold;
horizontal air flow path means extending generally vertically the height of said elongated heat pipes and extending generally horizontally along one of the dimensions of said stove housing, said air path means being defined in part by a bottom surface of said heat manifold and an upper surface of said fire chamber;

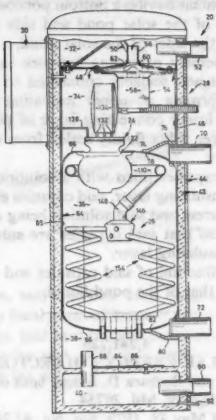


said heat pipes being arranged and aligned linearly in rows across said air path means with the heat pipes of next adjacent rows being offset in their relative lateral spacing; said heat pipes of next adjacent rows being spaced approximately mid-ways between the lateral spacing of heat pipes in said next adjacent row whereby said heat pipes contact said air flow head on and present an enlarged heat transfer surface transverse to the flow of horizontal air while affording sufficient space between said pipes to facilitate said air flow;
circulation means providing circulation of air generally horizontally through said stove housing along said air flow path means; and
a water reservoir adjacent said fire chamber carried within said stove housing being open at the top for release of water vapor into said air path means.

4,241,720
PULSE COMBUSTION APPARATUS
John A. Kitchen, R.R. #3, Hastings, Canada (K0L 1Y0)
Filed Jan. 26, 1979, Ser. No. 6,702
Int. Cl.³ F24H *3/02*
U.S. Cl. 126—110 C **12 Claims**

1. A pulse combustion heater comprising:
a housing which includes three housing sections of tubular form coupled together in a vertically stacked arrangement and comprising a top housing section defining an air cushion chamber, a center housing section defining a heat exchange chamber, and a bottom housing section defining an exhaust chamber, said top and bottom sections being in the form of concrete castings closed at their upper and lower ends respectively, and said center section forming part of a boiler sub-assembly further comprising top and bottom boiler heads closing opposite ends of said center housing section;
a combustion chamber disposed within said heat exchange chamber of the housing and having an inlet communicating with said air cushion chamber, and an outlet in said heat exchange chamber;
ignition means associated with said combustion chamber and operable to initiate combustion in said chamber; and,

at least one exhaust pipe forming a resonant system with said combustion chamber, said exhaust pipe being disposed in

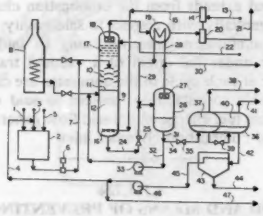


said heat exchange chamber and communicating with the exterior of said housing.

4,241,721
BODY WARMER
Gordon L. Holly, Rte. 1 Box 147, Hillman, Mich. 49746
Filed Mar. 17, 1980, Ser. No. 130,826
Int. Cl.³ A61F *7/06*
U.S. Cl. 126—204 **11 Claims**

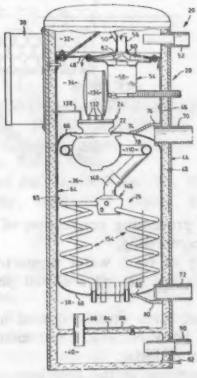
1. A body warmer to keep a person warm comprising, in combination, a platform having top and bottom surfaces and being substantially defined by a plane; a heat source secured to said platform so said person may stand on said platform top surface with each of said person's feet proximate said heat source; an envelope having an upper end and a lower end secured to said platform, said envelope being adapted to substantially surround the body of a person standing on said platform; at least one hoop secured to said envelope for preventing said envelope from contacting said heat source and for providing air circulation around a person in said envelope, said hoop being defined by a plane substantially parallel to the plane of said platform, thereby permitting said envelope to be collapsed onto said top platform surface around said heat source for storage; a shield substantially surrounding said heat source for preventing a person in said envelope from contacting said heat source; closure apparatus attached to said envelope upper end for supporting said envelope on said person in said envelope and for sealing said envelope against said person; and a cover having top and bottom surfaces and connection means for attaching said cover to said platform so said top platform surface faces said bottom cover surface whereby said heat source, said shield, and said envelope may be stored between said cover and said platform and said cover may be securely attached to said platform by said connection means.

4,241,722
POLLUTANT-FREE LOW TEMPERATURE COMBUSTION PROCESS HAVING CARBONACEOUS FUEL SUSPENDED IN ALKALINE AQUEOUS SOLUTION
Norman L. Dickinson, Box 211, Lavallette, N.J. 08735
Filed Oct. 2, 1978, Ser. No. 947,511
Int. Cl.³ F23C *7/00*
U.S. Cl. 126—263 **20 Claims**



1. A process for converting the heating value of a carbonaceous fuel to useful energy comprising the steps of:
grinding the fuel to form fuel particles;
mixing the fuel particles with an alkaline aqueous fluid to form a fuel slurry;
contacting the fuel slurry with air in a reaction zone the temperature and pressure of which are such as to cause a combustible portion of the fuel particles to burn while a portion of the aqueous fluid remains in liquid phase; and
extracting useful heat from the reaction zone.

4,241,723
PULSE COMBUSTION APPARATUS
John A. Kitchen, R.R. 3, Hastings, Canada (K0L 1YO)
Filed Nov. 15, 1978, Ser. No. 960,975
Int. Cl.³ A61M *27/00*
U.S. Cl. 126—350 R **17 Claims**



1. A pulse combustion apparatus comprising:
a combustion chamber;
at least one exhaust pipe forming a resonant system with said chamber;
means for admitting successive fuel charges to said chamber; and,
ignition means operable to initiate combustion in said chamber;
wherein the combustion chamber has an internal cavity which extends about a median plane, said cavity being of a shape which is circular in said plane and which curves

generally inwardly from both sides of said plane around its entire periphery towards first and second ends of said cavity;

and wherein the combustion chamber further includes: an inlet at one of its said ends, through which successive fuel charges can enter said combustion chamber from said fuel charge admitting means in a direction generally normal to said median plane of the combustion chamber; and an exhaust gas outlet disposed in said median plane;

and wherein said exhaust pipe is coupled to said exhaust gas outlet and extends from the combustion chamber generally tangentially with respect to said cavity;

whereby combustion gases returning to said combustion chamber under the effect of a vacuum transient in the chamber at each cycle of the apparatus are caused to flow in a double toroidal flow pattern in said cavity and a subsequent fuel charge enters said flow generally centrally from said combustion chamber inlet

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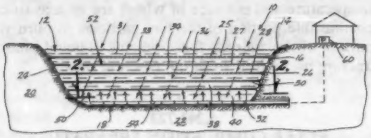
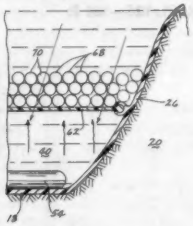
4,241,724

METHOD AND MEANS OF PREVENTING HEAT CONVECTION IN A SOLAR POND

John R. Hull, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 23, 1978, Ser. No. 953,593
Int. Cl.³ F24J 3/02
U.S. Cl. 126—415 **16 Claims**



1. A method of preventing convection of heat in a fresh water solar pond, comprising,

providing a body of fresh water supported on a bottom support surface and having a closed periphery and an upper surface,

providing at least three closely spaced horizontal membranes in said body of water; said membranes being a transparent film material,

sealing each membrane at the periphery of said body of water to prevent migration of water upwardly past said membranes, whereby water heated by the sun underneath the lowermost membranes will not move upwardly past any membrane,

imposing a closed conduit through the water adjacent one of the lowermost membranes whereby said water will not have access to the interior of said conduit,

and moving a fluid through said conduit whereby said fluid will absorb heat from said water by conduction through said conduit,

the index of refraction of said membranes being substantially that of said water.

16. An apparatus for preventing heat convection in a solar pond, comprising,

a liner element covering the sides and floor of a solar pond, said liner element having a bottom portion corresponding to the floor of the solar pond and side portions corresponding to the sides of the solar pond,

a membrane element extending between said sides of said liner element and sealably connected to said liner, said membrane forming an upper insulating layer of pond liquid and a lower convecting layer of pond liquid, said insulating layer being fluidly sealed from said convecting layer, and

a plurality of capsules filled with a solution and dispersed within said insulating layer, said capsules and said solution being transparent and said solution being denser than the pond liquid so that said capsules are submerged within said upper insulating layer,

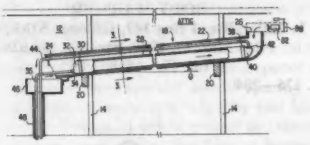
the index of refraction of said capsules and said solution is substantially that of the pond liquid.

4,241,725

SOLAR ENERGY COLLECTOR

Donald E. Emon, and Barbara D. Emon, both of 23029 Timber Creek La., Clarksburg, Md. 20734

Filed May 25, 1979, Ser. No. 42,705
Int. Cl.³ F24J 3/02
U.S. Cl. 126—428 **13 Claims**



1. In a building construction having an enclosed occupant space, a roof structure, and a solar heated air space between said occupant space and said roof structure, a solar water heating device adapted to be installed in said air space, said device comprising:

(a) a first hollow tube mounted in proximity to said roof structure and within said air space, said first tube having first and second open ends, said first open end being at a lower elevation than said second open end to facilitate the drainage of water, and the passage of solar heated air by natural convection therethrough, and

(b) at least one second hollow tube within and substantially coextensive with said first tube, said second tube having an inlet means at one end thereof for introducing water to be heated to said second tube and an outlet means at said other end for removing water from said second tube heated by said convected air.

4,241,726

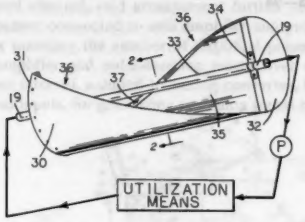
CONCAVE HELIX SOLAR CONCENTRATOR

David H. Doebel, 17745 Fruitport Rd., Spring Lake, Mich. 49456

Filed Aug. 18, 1978, Ser. No. 934,833
Int. Cl.³ F24J 3/02; G02B 5/10
U.S. Cl. 126—438 **6 Claims**

1. A cylindrical radiant solar energy concentrator system comprising an elongated reflector/collector core, said reflector having a semi-tubular concave shape formed in a helix having a reflective surface with up to 360 degrees of turns in its length, said turns producing a contiguous concave helix concentrating reflector, said concave helix reflector [illegible]ed by two

half circle end pieces respectively, said reflective surface oriented to accept solar radiant energy, said radiant energy reflected from said reflective surface so as to focus on said collector core element, said collector core element containing a heat



transfer medium, said collector core element being disposed within the sharp focal point of focus of said reflector to absorb said solar energy, said heat transfer medium absorbing energy directed thereto by said reflective surface and heating said transfer medium for use.

4,241,727

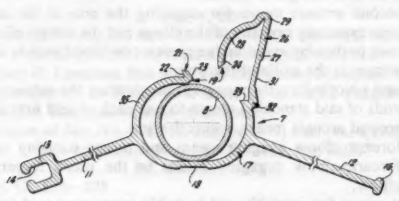
STRUCTURAL ASSEMBLY, METHOD OF FORMING SAME, AND ELONGATED PANEL STRUCTURE RESULTING THEREFROM

Andrew J. Toti, 311 W. River Rd., Modesto, Calif. 95351

Filed Nov. 6, 1978, Ser. No. 958,045

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—446 **16 Claims**



1. A structural assembly comprising an elongated preformed connecting member and an elongated tubular member to be integrally connected in surrounding and contacting relationship by said connecting member without requiring separate fastening means for effecting such connection; said connecting member and said tubular member being generally co-extensive in the direction longitudinally of said tubular member; said connecting member including an initially expanded preformed partially closed central body section to receive said tubular member therein, said body section being defined by at least one deformable section and elongated generally non-deformable plate sections extending laterally in generally opposite directions from and integrally connected with said central body section; said one deformable section including locking means defined by interengageable preformed shoulder and tooth structure including compatibly contoured edge and recess sections deformable into strut like locking engagement with each other to close and draw said body section of said connecting member around said tubular member generally in close conforming contact with said tubular member about the full periphery of said tubular member in gap-free contacting relationship with said tubular member for substantially its entire length.

4,241,728

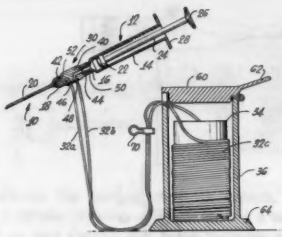
METHOD AND APPARATUS FOR DISPENSING RADIOACTIVE MATERIALS

Stuart Mirell, 10816 Cushdon Ave., Los Angeles, Calif. 90064

Filed Nov. 27, 1978, Ser. No. 963,690

Int. Cl.² A61N *5/12*

U.S. Cl. 128—1.1 **13 Claims**



1. Apparatus for use with a device for dispensing radioactive liquids in predetermined amounts, the device having dispensing means and reservoir and pump means connected thereto for drawing in, temporarily retaining, and pumping out liquid through the dispensing means, said apparatus comprising:

bypass means connectable between the dispensing means and the reservoir and pump means, to provide an extended-length liquid path therebetween, said bypass means including liquid storage means locatable remote from the dispensing means and reservoir and pump means;

shielding means surrounding only said liquid storage means of said bypass means, whereby radioactive liquids may be safely stored in said liquid storage means within said shielding means, and dispensed through the dispensing means in a conventional manner, without the need for cumbersome shielding around the dispensing means and reservoir and pump means.

4,241,729

ENDOSCOPE WITH GAS-TIGHT CAP PERMITTING PRESSURIZATION

Hisatake Aoshiro, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,748

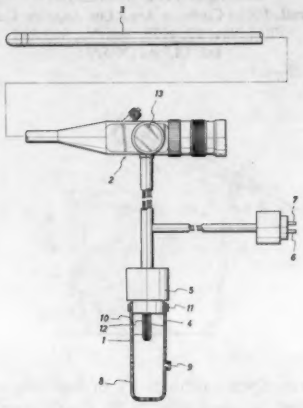
Claims priority, application Japan, Aug. 4, 1977, 52-103847[U]

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **4 Claims**

1. An endoscope comprising a grip end, an elongated sheath adapted to fit into a body orifice having a distal end and a proximal end, a fiber optic bundle extending from said proximal end to said distal end of said sheath, said grip end connected with said sheath and said sheath terminating in an examining end, said endoscope including said sheath having a closed inner cavity portion, the portions of said endoscope forming the walls of said closed cavity being non-expandable, said cavity extending along a major portion of said sheath, said sheath being flexible, a plug enabling a light source to be connected with said fiber optic bundle, a gas flow path through said plug permitting gas to flow therethrough and being in air communication with said closed inner cavity portion, a gas-tight cap having a gas inlet means in air communication with said gas flow path through said plug, and a source of pressurized gas connected to said gas inlet means to introduce pressurized gas into said closed inner cavity portion to be contained

therein, whereby said pressurized gas prevents cleansing liquid on the outside of said endoscope from permeating said sheath



and highlights pinholes in said sheath by the production of fluid bubbles thereat.

4,241,730

KNEE SUPPORT

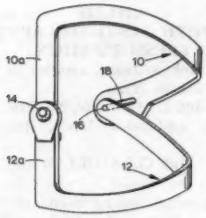
Arthur J. Helfet, 420 Montebello, Montrose St., 7700 Newlands, Cape Town, South Africa

Filed Sep. 7, 1977, Ser. No. 831,187

Claims priority, application United Kingdom, Sep. 20, 1976, 38813/76

Int. Cl.³ A61F *3/00*

U.S. Cl. 128—80 C **13 Claims**



1. A knee support for opposing excessive or abnormal strain on the joint, comprising a pair of pivotally interconnected rigid braces, the one adapted to embrace snugly the front of the thigh just above the patella and the other adapted to embrace snugly the front of the shin just below the patella, the pivots being aligned approximately on the mean medial-lateral axis of flexion of the knee and at least the pivot on the lateral side having freedom of universal pivotal motion whilst that on the medial side has limited freedom of relative bodily displacement in the anterior-posterior direction, both freedoms being of sufficient magnitude to accommodate the wearer's normal degree of tibial rotation during flexion and extension, and means for locating each brace firmly on its respective component of the limb.

4,241,731

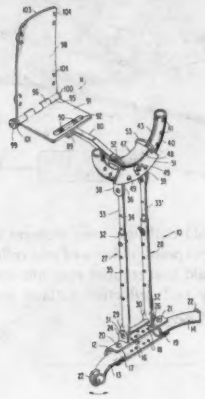
UNIVERSAL ARM SUPPORT

James H. Pauley, Rte. 1, Box 251, Ripley, W. Va. 25271

Filed May 11, 1978, Ser. No. 905,088

Int. Cl.³ A61F *5/40*

U.S. Cl. 128—94 **7 Claims**



1. A universal arm brace adapted to support the fractured immobilized upper body limb or extremity of a person comprising,

a first arcuate means for engaging the trunk of the user for transferring substantially all load supported by said brace when the user is standing to the hip of the user and means securing said first arcuate means to the trunk of the user

a stanchion elongated means,

a second arcuate means for engaging the arm of the user approximately midway of the elbow and the armpit of the user to thereby avoid undue pressure on blood vessels and nerves in the axilla of the user,

means pivotly directly engaging and securing the respective ends of said stanchion means to one each of said first and second arcuate means, respectively,

a forearm-elbow egaging means and means securing said forearm-elbow engaging means to the user's forearm-elbow,

and means for rotatably and lockably supporting said forearm-elbow engaging means on said second arcuate means about a horizontal axis which is transverse to an axis through the trunk of the user to maintain the fractured upper body limb or extremity of the person in an elevated position above the heart when said person is alternately standing, sitting or lying in a supine position.

4,241,732

ARRANGEMENT IN RESPIRATORS USING A FLUIDISTOR TO DETERMINE VOLUME OF AIR PASSED TO A PATIENT AND PRESSURE SENSOR TO CORRECT VOLUME READING IN TERMS OF ACTUAL PRESSURE

Christer Berndtsson, Lidingö, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Nov. 16, 1978, Ser. No. 961,206

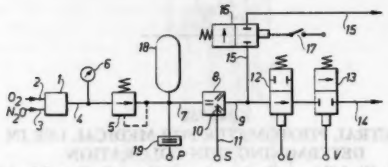
Claims priority, application Sweden, Nov. 29, 1977, 7713464

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.24 **4 Claims**

1. An arrangement for use in a respirator for measuring the amount of gas passed to a patient through a supply line, said arrangement comprising means disposed in the supply line to the patient for dividing the gas flow into part volumes of a given magnitude and for generating an electrical pulse for each part volume passing therethrough, said means comprising a

self-oscillating fluidistor having two outputs and including a control channel having a temperature-dependent resistance located therein and an amplifier and pulse-forming means connected to said resistance for generating electrical pulses whose number is related to the part volumes flowing through said control channel, said arrangement further comprising a binary counter connected to said amplifier and pulse-forming means for counting the number of electrical pulses produced by said amplifier and pulse-forming means over a predetermined time interval, a digital-to-analog converter, having first and second inputs, for generating an analog signal corresponding to the number of pulses produced per said time interval by said amplifier and pulse-forming means, said first input of said digitial-to-analog converter being connected to the output of said amplifier and pulse-forming means, and a pressure-sensing means connected in said supply line to the patient and to said second input of said digital-to-analog converter in series with a calibrating resistance for producing an electrical control voltage in response to the pressure in said supply line and for applying said electrical control voltage to said second input of said digital-to-analog converter so as to correct the output signal of said conveter in accordance with part volumes of a given predetermined pressure.



4,241,733

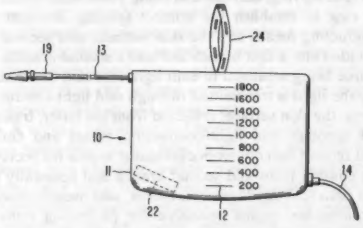
PATIENT-CARE APPARATUS WITH DEVICE FOR DISPENSING ANTI-PATHOGENIC AGENT

Jimmy B. Langston, San Jose; Harold Leeper, Mountain View, and Patrick S. Wong, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 804,962, Jun. 9, 1977, Pat. No. 4,193,403. This application Sep. 24, 1979, Ser. No. 78,507

Int. Cl.³ A61F *5/44*

U.S. Cl. 128—275 **4 Claims**



1. A patient-care apparatus, comprising in combination: a container for receiving and storing a biological fluid; an inlet port in the container for establishing fluid passage between the interior and the exterior of the container; and a device in the container for substantially controlling the presence of pathogens in the apparatus, said device consisting of a body sized and adapted for prolonged placement in the container and having a surface exposed to the container, the body formed of a polymeric material containing paraformaldehyde, which is converted to formaldehyde when the apparatus is in use and released by the surface for controlling said pathogens.

4,241,734

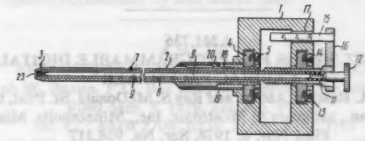
DEVICE FOR PUTTING CLIPS ON BLOOD VESSELS

Eduard I. Kandel, ulitsa Alexeya Tolstogo, 22/2, kv. 75, and Vyacheslav V. Peresedov, Teply stan, 3 mikroraion, korpus 37, kv. 303, both of Moscow, U.S.S.R.

Filed Nov. 27, 1978, Ser. No. 963,677

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **3 Claims**



1. A device for putting clips on vessels, comprising: a shackle; a tubular housing member having a tapered end and mounted on said shackle and being movable along an axis; a removable and threaded guide rod adapted to be inserted into the cavity of said tubular housing member for guiding said tubular housing member to the vessel to be clipped; a working rod including a tubular member, and a grip having means for holding said clip, also adapted to be inserted into the cavity of said tubular housing member; said grip being positioned within said tubular member by a spring controllable by an adjusting knob; said working rod being disposed coaxial with respect to said tubular housing member and movable along said axis; each of said working rod and said tubular housing member having threaded means and associated adjusting wheels mounted in said shackle for controlling the axial movements thereof; said adjusting wheel for said working rod also used for controlling the axial movement of said guide rod; and each of said threaded guide rod and said working rod having a rule cooperatively associated with said shackle for respectively monitoring the depth of said guide rod and for setting the point at which the jaws of said clip are opened prior to clipping and releasing said clip onto said vessel.

4,241,735

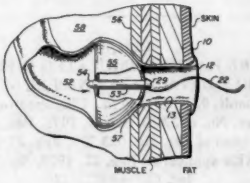
ILEOSTOMY AND COLOSTOMY PLUG

Merrill S. Chernov, 4151 N. 32nd St., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 914,582, Jun. 12, 1978, abandoned. This application Jan. 24, 1980, Ser. No. 115,024

Int. Cl.³ A61M *29/02*; A61F *5/44*

U.S. Cl. 128—344 **6 Claims**



1. A closure appliance for an artificial human body bowel opening extending through the abdominal wall comprising:

an elongated tubular plug having a roundedly pointed end for extending into the artificial bowel opening through the abdominal wall and into the intestinal lumen; the other end of said plug being an insertion means for the appliance;

a hollow, inflatable, elastic balloon secured annularly therealong to and surrounding most of the outer periphery of said plug;

said balloon having at least one conical surface which when inserted in said artificial opening and then inflated, forms

a sealing engagement with the inner surface of said artificial opening;

a hollow tube connected to and in communication with the interior of said balloon at a location adjacent said other end of said plug, the other end of said tube being removably connectable to an inflating means for said balloon;

said tube additionally providing a withdrawal means for said appliance; whereby when said balloon is deflated, pulling the tube will remove said appliance.

4,241,736

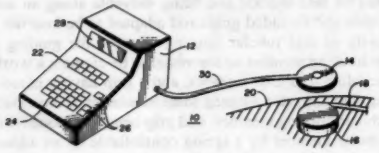
RESET MEANS FOR PROGRAMMABLE DIGITAL CARDIAC PACEMAKER

Martin A. Rossing, Anoka, and Ray S. McDonald, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 958,317

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **10 Claims**



1. In a programmable medical device having program acceptance means responsive to an externally applied programming signal consisting of at least a minimum number of detectable pulses, and program memory means for providing device operating conditions in accordance with said programming signal, the improvement comprising:

pulse counter means for counting said programming pulses and providing a check signal indicating that the proper number of programming pulses have been received to constitute a programming instruction;

means responsive to said check signal for enabling said program acceptance means to store the programming signal in said program memory means; and

timing means responsive to said pulse counter means having a non-initial count therein for resetting said pulse counter means to an initial count a certain time after said pulse counter means first reaches said non-initial count unless said check signal first occurs, said certain time being greater than the time required to apply said programming signal.

4,241,737

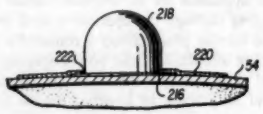
BRASSIERE HAVING SIMULATED NIPPLES AND ATTACHABLE-DETACHABLE NIPPLE SIMULATORS

Jakob E. Schmidt, 934 Monroe St., Charlestown, Ind. 47111

Division of Ser. No. 692,820, Jun. 4, 1976, Pat. No. 4,127,128, which is a division of Ser. No. 553,779, Feb. 27, 1975, Pat. No. 3,976,083. This application Sep. 21, 1978, Ser. No. 944,536

Int. Cl.³ A41C *3/00*

U.S. Cl. 128—425 **6 Claims**



1. In a brassiere having a pair of breast receiving cups serially disposed along the length of a brassiere band, said cups comprising a layer of flexible fabric material, an improved simulated nipple attached to said layer of each cup, comprising a stud element having an exterior profile simulating the profile of the nipple of a human female breast and means cooperating with said stud element and said layer for attaching said stud element to said breast receiving cup, whereby the exterior profile of said stud element is noticeable exteriorly of said brassiere to enhance the appearance of bralessness when said brassiere is worn beneath outer garments, wherein said attaching means comprises a radially extending flange on said stud element and an iron-on patch of material having an aperture sized to receive said stud element whereby said flange retains said stud element in said aperture.

4,241,738

SPECTRAL PHOTOMETER FOR MEDICAL USE IN DETERMINING SKIN COLORATION

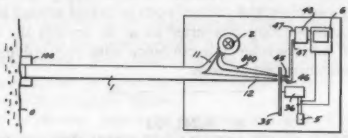
Dietrich W. Lübbers, Dortmund, and Ernst Guilino, Munich, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft zur Förderung der Wissenschaften, Göttingen, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 895,123

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726606

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—666 **2 Claims**



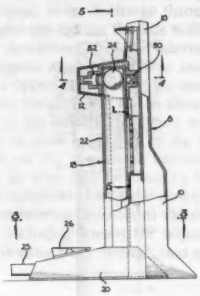
1. A spectral photometer for use in evaluating the coloration of the human skin surface, of the type having a light source, light-conducting means and light-sensitive means for generating signals dependent upon intensity of the light received therein, in the combination comprising: the light conducting means, including flexible fiber optics members interspersed among one another, having one end and a second end: a support and spacing ring, said one end being positioned within said spacing ring to establish the correct spacing between said light-conducting means and the skin surface, said second end being divided into a first branch and into a second branch, said light source being arranged to emit light into said first branch, whereby the light is transmitted through said light-conducting means onto the skin surface, reflected from the latter, transmitted back through said light-conducting means and emitted from said second branch; monochromator means for receiving the light emitted from said second branch and spectrally projecting it onto said light-sensitive means, said monochromator means comprising means operative for projecting onto the light-sensitive means successive portions of the spectrum of the light received from the second branch in a progressive and periodic sequence; display means connected to receive signals generated by the light-sensitive means and produce a spectral display of the light reflected from the skin surface, said display means comprising an oscilloscope having an information-signal input connected to the light-sensitive means, and sychronizing means for synchronizing the sweep of the oscilloscope with the periodic operation of said monochromator means, said monochromator means comprising a rotating filter having angularly successive sections to transmit successive parts of the spectrum of the light received from said second branch onto said light-sensitive means.

4,241,739

VOLUME CALCULATOR FOR INCENTIVE SPIROMETER

Edward E. Elson, Anaheim, Calif., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 13, 1978, Ser. No. 959,911
Int. Cl.³ A61B *5/08*
U.S. Cl. 128—725 **24 Claims**



1. A device for use in conjunction with a flow meter having an indicator which moves to a position corresponding to the flow rate through said flow meter, said device comprising:

a housing containing a detector means, a timing means, a processing means, a first and a second storage means and an alphanumeric display means;

said first storage means for receiving and storing information representative of the minimum flow rate required through said flow meter to move said indicator to said position;

said detector means for detecting and indicating the presence of said indicator at said position;

said timing means coupled to said detector means for measuring the time during which said detector means indicates the presence of said indicator at said position;

said second storage means for receiving and storing information representative of a desired minimum volume;

said processing means coupled to said timing means and to said first storage means for generating information representative of the cumulative volume flow through said flow meter, said processing means further performing a comparison of said generated information and the information stored in said second storage means; and

said alphanumeric display means coupled to said processing means for displaying an indication in the event said generated information is representative of a volume equal to or greater than the volume represented by the information stored in said second storage means.

15. A volume calculator and incentive display device for use with a spirometer of the type in which a movable indicator contained in a chamber moves to a certain position in said chamber only when the patient's breathing flow rate through said spirometer equals or exceeds a value set by a flow regulator control on said spirometer, said device comprising:

a case removably placeable onto said spirometer, said case including a detector housing which is situated adjacent said chamber certain position when said case is placed on said spirometer.

detection means, situated in said detector housing, for detecting the presence of said indicator at said certain position and for providing an electrical detection signal in response thereto,

presettable volume register means, situated in said case, for storing data representing the desired minimum volume of air to be breathed by the patient in a single breath,

volume determination means, situated in said case and cooperating with said detection means, for electrically ascertaining from said detection signal the actual minimum volume of air breathed by said patient in a breath,

an alphanumeric display situated on said case, and,

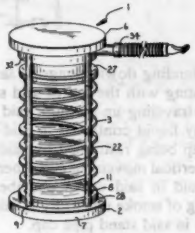
incentive indication means, situated in said case and cooperating with said volume register means and said volume determination means, for providing on said display an incentive indication when said ascertained actual minimum volume equals or exceeds said desired minimum volume represented by said stored data.

4,241,740

BELLOWS TYPE INCENTIVE SPIROMETER

Joseph W. Brown, P.O. Box 385, Blue Springs, Mo. 64015

Filed Mar. 5, 1979, Ser. No. 17,591
Int. Cl.³ A61B *5/08*; B23P *11/02*; F16J *3/04*
U.S. Cl. 128—728 **10 Claims**



1. A spirometer comprising:

(a) an upright, hollow frame structure having opposite end portions;

(b) an expansible and contractible bellows responsive to exhalation and inhalation and including;

(1) a hollow, resilient helical structure having opposite ends and with a plurality of coils respectively having relatively broad upper and lower surfaces and relatively thin outer edges;

(2) opposite closed end members connected to the opposite ends of said helical structure, one of said closed end members being connected to one of said end portions for affixing said bellows to said frame structure;

(3) a sheath of thin, fluid-impervious film extending the length of an expanded said helical structure and situated generally externally thereof, said sheath protruding inwardly and radially between said coils toward a longitudinal axis of said helical structure, thereby forming convolutions of said film embracing said coils only along portions of said upper and lower surfaces and outer edges with a gripping engagement tending to prevent movement of said helical structure relative to said sheath, said sheath joining said opposite closed end members and defining an impervious outer wall structure for said bellows; and

(c) a passage means connected to said one of said closed end members and communicating with an interior of said bellows for transmitting inhalation and exhalation pressures thereto.

4,241,741

SPILL PROOF BONG

Rick H. Cabados, 1735 Pentuckett Ave., and Robert E. Hansen, 762 Santa Rita Rd., both of San Diego, Calif. 92109

Filed Jun. 11, 1979, Ser. No. 47,309
Int. Cl.³ A24F *1/14, 1/30*
U.S. Cl. 131—173 **4 Claims**

1. A bong comprising:

(a) an upright barrel;

(b) a partition extending across said barrel defining an aqueous chamber over said partition;

(c) a hollow stand pipe extending upwardly through said partition into said aqueous chamber such that liquid maintained in said aqueous chamber at a level below that of the top of said stand pipe will not drain through said stand pipe;

(d) a pipe bowl mounted on said barrel and means defining a smoke passageway between said bowl and the bottom of said stand pipe; and an elongated stand pipe cap covering

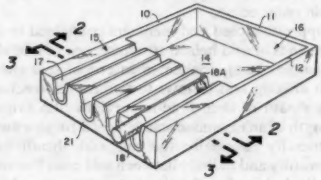
and extending down alongside said stand pipe and communicating with the top of said stand pipe to divert any smoke traveling up through said stand pipe back down into any liquid contained in said aqueous chamber, said pipe cap being restrained by said stand pipe to substantially vertical movement and otherwise is free to bobble in the liquid in said upper chamber and responds to the drawing of smoke upwardly in said stand pipe and downwardly in said stand pipe cap.

4,241,742

ASHTRAY TO CONTROL BURNING RATE OF CIGARETTE

Arthur W. Hilding, 1634 Creek Dr., San Jose, Calif. 95125

Filed May 23, 1979, Ser. No. 41,697
Int. Cl.³ A24F *13/18, 19/14*
U.S. Cl. 131—235 R **3 Claims**



1. An ashtray for controlling the rate of burning of an unattended cigarette and for reducing the condensation of tars and moisture around and on the cigarette, comprising in combination:

an ash container formed between side walls;

spaced walls in one side wall forming a first groove;

a liner formed of a good heat conducting material and supported within said first groove to form a second groove having continuous and substantially vertical side walls and a bottom wall extending substantially the length of the cigarette, said side walls being spaced apart a distance slightly less than the cross-sectional diameter of the cigarette so the cigarette can be wedged therebetween and suspended above the bottom wall to form a chamber bounded by the cigarette, a bottom portion of the side walls and the bottom wall; and

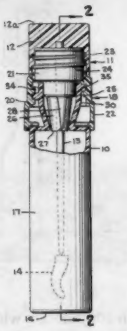
said liner being held in spaced relationship to said spaced walls of the side wall for heat insulating the from the ash container to control the loss of heat from the liner whereby the member will be heated by the burning cigarette wedged in said groove and prevent condensation on and around the cigarette and the side walls will prevent accidential touching of the heated liner.

4,241,743

ADJUSTABLE WIPER CONTAINER AND APPLICATOR ASSEMBLY FOR COSMETICS AND THE LIKE

Peter W. Schnabel, Shrewsbury, Pa.; Milton P. Chernack, West Hempstead, N.Y.; Lawrence T. Wilkes, York, Pa., and Gordon R. Perry, Brooklyn, N.Y., assignors to Noxell Corporation, Baltimore, Md.

Filed Mar. 13, 1979, Ser. No. 20,247
Int. Cl.³ A45D *40/26*
U.S. Cl. 132—88.7 **21 Claims**



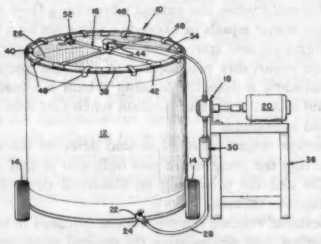
1. A cosmetic applicator and container assembly comprising a container for cosmetic material having an opening, an applicator having an elongated stem to extend through the opening and an elongated brush-like applicator head formation extending from and carried by an end of the stem adapted to be stored in the container and coated by the cosmetic material, an elastic deformable wiper mounted on the container at said opening having movable wiper edge portions defining a variable size wiper orifice through which the applicator head formation is to be withdrawn for use of the applicator in applying cosmetic material, and a manually adjustable orifice regulating member movable to various different positions on the container adjacent said opening and having means to vary the positions of said wiper edge portions for moving said wiper edge portions relative to each other to provide different wiper orifice sizes and thereby vary the wiping action of the wiper on the applicator head formation as it is withdrawn for use to control the amount of cosmetic material remaining on the head formation.

4,241,744

CLEANING SYSTEM FOR TANKS

Nathaniel Jordan, Sr., 1266 Springwood Cir., Winston-Salem, N.C. 27107

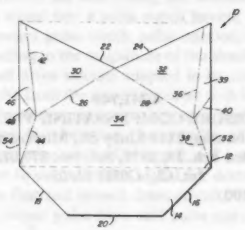
Filed Jul. 2, 1979, Ser. No. 54,036
Int. Cl.³ B08B *9/08*
U.S. Cl. 134—168 R **8 Claims**



1. Apparatus for cleaning residue from the internal surfaces of a vertical side wall of a tank having an upper open end and

a discharge valve at the lower end thereof by circulating a cleaning fluid substantially completely over the entire internal surfaces at a controlled minimum pressure to prevent spraying of the surfaces, comprising; a ring assembly, said ring assembly including an arcuate ring-like means defining a series of openings therein, fluid inlet means located centrally of said arcuate ring-like means, and distribution means for directing cleaning fluid radially from said inlet means to said ring-like means, means for supplying cleaning fluid to said fluid inlet means at a selected low pressure for distribution to said ring-like means for substantially equal, even discharge through each opening of said series of openings against the side wall uppermost inner surfaces for flow downwardly of the internal surfaces of the tank side wall, support means secured to said ring-like means for support by the upper open end of the tank for positioning said ring-like means parallel with and in close proximity to the internal surfaces of the tank vertical side wall and with said series of openings in close proximity to the side wall vertical surfaces and adjacent the uppermost internal surfaces of the wall for directing an even flow of cleaning fluid onto the side wall to provide a complete fluid flow downwardly over substantially the entire internal surfaces of the side wall, said ring assembly further including means for adjustably controlling the flow rate of cleaning fluid through said series of openings.

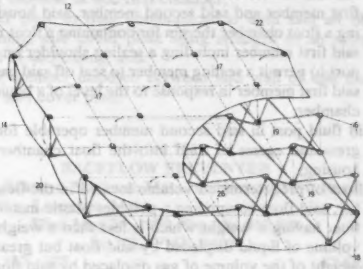
4,241,745
LIGHTWEIGHT, PORTABLE SHELTER FOR BACKPACKERS
Edward L. Knox, 501 NW. 9th St., Bentonville, Ark. 72712
Filed Aug. 30, 1979, Ser. No. 71,686
Int. Cl.³ E04B *1/343*
U.S. Cl. 135—1 R **9 Claims**



1. A collapsible, portable shelter adapted for use with a backpack, said shelter comprising:
a top portion produced from a flexible, semi-rigid, shape sustaining material and formed in a continuous covering having an upper section and a lower section with the upper section disposed above said lower section and said lower section including a ground contacting peripheral edge;
a floor connected to said ground contacting peripheral edge and having an ingress and egress means formed therein, said ingress and egress means comprising an opening in said floor.

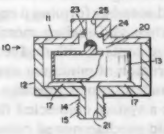
4,241,746
COLLAPSIBLE BUILDING STRUCTURE
Bruce Rothe, 2046 Rutledge St., Madison, Wis. 53704
Filed May 2, 1979, Ser. No. 35,222
Int. Cl ³ E04B *1/347*
U.S. Cl. 135—4 R **18 Claims**

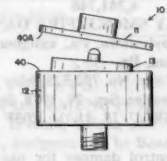
1. A structure comprising:
(a) first and second membranes disposed in spaced relation and having lines of tension defining corresponding rectilinear grid patterns in each of said membranes;
(b) a plurality of node members attached to each of the two membranes such that each node member on said first membrane is paired with a corresponding one of said node members on said second membrane, said node members on each of said membranes being arranged along each line of tension such that each node member is located at an intersection of lines of tension in said membranes and is separated by intersecting lines of tension in said membranes from adjacent node members lying along the same lines of tension;
(c) a plurality of tensile members, each said tensile members extending in tension from attachment to one of said node members on said first membrane to attachment to the node member on said second membrane that is paired with said one node member on said first membrane; and



(d) a plurality of compression struts, said struts being arranged such that, at each node member on said first membrane, struts extend in compression from attachment to said node member on said first membrane to attachment to each of said node members on said second membrane which are most closely adjacent to and substantially equidistant from the node member on said second membrane which is paired with said one node member on said first membrane, whereby said struts will lie substantially along the diagonals of the rectilinear lines of tension which extend between adjacent node members.

4,241,747
SAFETY VALVE HAVING A RUPTURABLE HOUSING
Lloyd H. King, Sr., 311 Blake Rd., Hopkins, Minn. 55343
Filed Nov. 1, 1978, Ser. No. 956,624
Int. Cl.³ F16K *17/40*
U.S. Cl. 137—68 R **1 Claim**





1. A two fluid valve comprising:
a first member formed from a polymer plastic material, said first member having a gas port therein, said first member having a surface for forming sealing engagment with another surface;

a second member, said second member formed from a polymer plastic material, said second member having a fluid port therein, said second member having a surface for mating with said surface on said first member to thereby provide a sealing region between said surface on said first member and said surface on said second member, said sealing region having means operable for securing said first member to said second member so that said surface on said first member will separate from said surface on said second member in response to a predetermined pressure in said two fluid valve, said first member and said second member coacting to form a housing when said surface on said first member is in mating engagement with said surface on said second member, said housing defined by said first member and said second member, said housing having a float chamber therein for containing a float member, said first member including a sealing shoulder on said gas port to permit a sealing member to seal off said gas port in said first member in response to the level of a liquid in said chamber;

said fluid port in said second member operable for the ingress and egress of fluid into the float chamber in said housing;

a float of predetermined volume located in the float chamber, said float comprising a polymer plastic material, said float having a weight which is less than a weight of the volume of liquid displaced by said float but greater than weight of the volume of gas displaced by said float, a gas port sealing member located on said float for sealing said gas port in response to liquid reaching a predetermined level in the float chamber to thereby prevent discharge of fluid through said gas port, said sealing member having a sufficiently short projection so that the tilting of said two fluid valve does not produce misalignment of said sealing member with said gas outlet port;

said housing including members for supporting said float in a spaced position from said fluid port to permit ingress and egress of fluid past said float when said float is located on said supporting members whereby said two fluid valve is operable for normally permitting ingress and egress of gas through said gas port when the liquid level in the float chamber is insufficient to force said sealing member on said float into sealing contact with said shoulder on said gas port and for normally not permitting ingress and egress of fluid through said gas port when the liquid level in said float chamber is sufficient to force said sealing member on said float into sealing contact with said shoulder on said gas port;

said sealing region securing means between said first member and said second member forming a region of minimum strength so that when said sealing member on said float chamber is in sealing contact with said sealing shoulder on said gas port, said region of minimum strength is operable for rupture at a predetermined pressure level to thereby prevent damage to a system connected thereto should the pressure exceed said predetermined pressure level.

4,241,748

BUTTERFLY SMOKE/FIRE DAMPER

Francis J. McCabe, Doylestown, Pa., assignor to Prefco Products, Inc., Buckingham, Pa.

Continuation-in-part of Ser. No. 792,525, May 2, 1977, Pat. No. 4,146,048. This application Sep. 29, 1978, Ser. No. 947,104

Int. Cl.[3] **F16K** *17/38, 31/04;* **E05F** *15/20*

U.S. Cl. 137—77 **19 Claims**

1. A smoke/fire control damper for use in a duct, said damper comprising:

a. a frame adapted for mating with an opening of said duct;

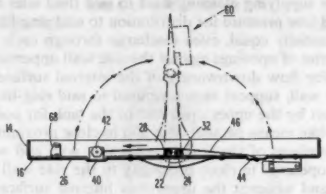
b. a cross bar extending across said frame;

c. at least two substantially planar damper blades which engage said cross bar for pivotal displacement about said cross bar between open and closed positions; and

d. operating means for pivoting said blades between the open and closed positions, said operating means comprising:

(i) a first operator cable guide means disposed in said frame;

(ii) a second operator cable guide means attached to a first one of said damper blades in a location which is offset from said first operator cable guide means;



(iii) an operator cable slidingly engaging said first and second operator cable guide means, one end of said operator cable being attached to an attachment point on a second one of said blades, said attachment point located substantially opposite said second operator cable guide means when said blades are in the open position; and

(iv) means for exerting tension on said operator cable.

4,241,749

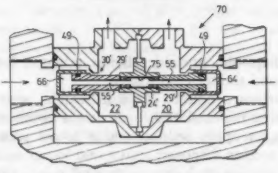
PRESSURE COMPENSATING VALVE

Sigurdur G. Petursson, 2169 Linby St., Mississauga, Canada

Filed Feb. 13, 1978, Ser. No. 877,012

Int. Cl.[3] **G05D** *11/03*

U.S. Cl. 137—100 **2 Claims**

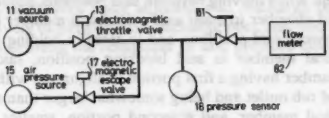


1. In a pressure compensating valve having a valve body, a pair of fluid inlets to receive first and second pressurized fluids therein, a pair of fluid outlets each connected in fluid receiving relation with a respective one of said inlets, to discharge said fluids, a spool member mounted in said body in axial sliding relation therein, diaphragm means connected to said spool member being positioned within said body adjacent said outlets to separate said first and second fluids and moveable thereby to regulate the passage of said fluids between said inlets and said outlets in pressure balanced relation, a pair of spaced apart chambers in said valve body receiving respective portions of said spool member in fluid sealing relation therein, the improvement comprising substantially unrestricted passage means extending through the spool and exclusively interconnecting said chambers to permit free transfer of fluid therebetween on axial displacement of the spool member responsive to movement of said diaphragm means in the valve body.

4,241,750
PRESSURE SETTING DEVICE

Akio Furuse, and Yoshihiro Honma, both of Hachioji, Japan, assignors to Kabushiki Kaisha Cosmo Keiki, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 963,876
Int. Cl.[3] G05D *16/20*
U.S. Cl. 137—101.19 9 Claims



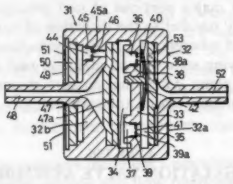
1. A pressure setting device comprising:

a pneumatic pressurizing source; a pneumatic depressurizing source; a controlled system; a first electromagnetic valve inserted in a pipe interconnecting the pneumatic pressurizing source and said controlled system for applying and cutting off air pressure from the pneumatic pressurizing source to said controlled system; a second electromagnetic valve inserted in a pipe interconnecting the pneumatic depressurizing source and said controlled system for reducing the pressure applied to said controlled system; a pressure sensor for detecting, as an electric signal, the pressure of the controlled system; a deviation detecting comparator for producing a deviation signal representative of a deviation between the output from said pressure sensor and a set value; a full-wave rectifier for converting the value of the deviation signal into an absolute value; a pulse converter for converting the absolute value of the deviation signal into a pulse signal having at least one of the parameters pulse width, pulse interval, and frequency corresponding to the magnitude of the absolute value; first and second drive circuits adapted to be controlled by an output pulse from the pulse converter to drive the first and second electromagnetic valves, respectively; a selecting comparator for detecting the polarity of the deviation signal to produce a selection signal; and a selection circuit responsive to said selection signal for determining which one of the first and second drive circuits is to be supplied with the output pulse from said pulse converter.

4,241,751
VACUUM TRANSMITTING VALVE

Takao Nonoyama, and Kunihiko Sato, both of Toyoda, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 740,042, Nov. 8, 1976, abandoned. This application Oct. 21, 1978, Ser. No. 953,209
Claims priority, application Japan, May 7, 1976, 51-58100
Int. Cl.[3] F02P *5/06, 5/10;* F16K *45/00*
U.S. Cl. 137—103 5 Claims



1. In a vacuum transmitting valve of the type including:

a casing having a first end wall, a second end wall, and a cylindrical side wall;

a partition defining a first chamber and a second chamber in said casing, said partition having an orifice and an air vent;

an inlet port opening into said first chamber through said first end wall;

an outlet port opening into said second chamber through said second end wall; and

a closure member secured to said partition, said closure member being movable to close said air vent when the pressure of said first chamber is lower than that of said second chamber, and open said air vent when the pressure of said first chamber becomes higher than that of said second chamber;

the improvement which comprises:

an air bleed opening in fluid communication with said first chamber;

a filter member in said first chamber;

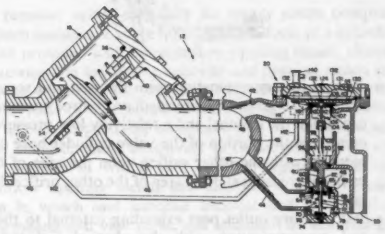
a cover plate in fluid communication with said air bleed opening, said cover plate being attached to an external wall of said casing; and

a filter member disposed between said wall of said casing and said cover plate.

4,241,752
BACKFLOW PREVENTER

Rand H. Ackroyd, Methuen, Mass., assignor to Watts Regulator Company, Lawrence, Mass.

Filed May 30, 1978, Ser. No. 910,509
Int. Cl.[3] F16K *24/00*
U.S. Cl. 137—107 17 Claims



1. A backflow preventer comprising

a body defining a passage for flow of liquid between a supply pipe and a service pipe,

a check valve in said body passage, and

a relief valve assembly connected to said body passage downstream of said check valve, said assembly comprising

a liquid drainage passage connected to a first port in said body passage downstream of said check valve,

a first valve in said drainage passage,

a gas intake passage connected to a second port above said first port in said body passage downstream of said check valve,

a second valve in said intake passage, and means for automatically opening said first and second valves in response to predetermined relative pressure conditions in said supply and service pipes.

4,241,753
CONTROL VALVE FOR USE WITH VARIABLE DISPLACEMENT PISTON PUMP

Louis R. Erwin, Livonia, Mich., and Frank Woodruff, New Hartford, N.Y., assignors to The Bendix Corporation, Utica, N.Y.

Continuation of Ser. No. 794,774, May 9, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,258
Int. Cl.[3] G05D *11/00*
U.S. Cl. 137—116.3 8 Claims

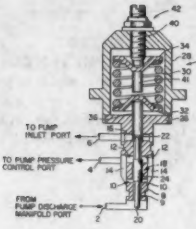
1. A pressure control valve for a pump having a relatively high discharge pressure, comprising:

a valve cylinder having a bore extending at least partially therethrough;

a pressure inlet port extending external to the valve and communicating with the valve cylinder bore and the pump whereby the relatively high pump discharge pressure is transmitted to the valve;

a spring loaded valve spool disposed within the valve cylinder bore and responsive to the relatively high pump discharge pressure transmitted to the valve for being displaced against the spring load;

first and second orifices disposed substantially apart from communicating with separate portions of the valve cylinder bore, the first orifice communicating with the portion of the valve cylinder bore communicating with the pressure inlet port and said first and second orifices disposed relative to the valve spool so that the displacement of the valve spool increases the area of one of the orifices and decreases the area of the other of the orifices;



a channel in communication with the first and second orifices, with a relatively intermediate control pressure being created in the channel and a relatively low pressure being created in the portion of the valve cylinder bore communicating with the other orifice upon the area of the one orifice increasing and the area of the other orifice decreasing;

a first pressure outlet port extending external to the valve and communicating with the channel and the pump whereby the relatively intermediate control pressure is transmitted to the pump; and

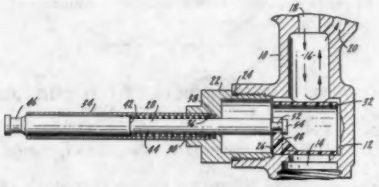
a second pressure outlet port extending external to the valve and communicating with the portion of the valve cylinder bore communicating with the other orifice and communicating with the pump, whereby the relatively low pressure is transmitted to the pump.

4,241,754

PUSHBUTTON DIVERTER

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Sep. 28, 1978, Ser. No. 946,811
Int. Cl.³ F16K *31/44, 51/00*
U.S. Cl. 137—119 **7 Claims**



1. A shower-tub diverter valve including a housing having a diverter chamber, a water inlet and shower and tub outlets in communication with said chamber,

a diverter reciprocal in said chamber between a position providing communication between said inlet and tub outlet and a position in which said diverter blocks said communication,

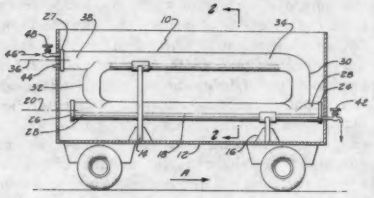
said diverter having a stem and a loosely attached cylindrical member formed of a somewhat distortable material, said cylindrical member being in substantial sealing relation with said tub outlet when in said blocking position, said cylindrical member being movable relative to said stem when moving between said positions, guide means in said chamber to assist said cylindrical member in moving between said positions, and to assist in holding said cylindrical member in said blocking position, said diverter chamber having a first portion in alignment with said inlet and tub outlet and being somewhat larger than said cylindrical member, and a second portion, smaller than said first portion and more closely sized relative to said cylindrical member, said guide means being between said first and second diverter chamber portions so that when said cylindrical member is in said position blocking said communication, said cylindrical member is moved relative to said stem by water pressure at said water inlet to thereby coact with said guide means to substantially prevent reciprocal movement of said cylindrical member.

4,241,755

ANTI-SURGE LIQUID TRANSPORTING APPARATUS

Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77094

Filed Nov. 21, 1977, Ser. No. 853,212
Int. Cl.³ B60P *3/24*; B61D *5/02*; B65D *7/00*
U.S. Cl. 137—899 **11 Claims**



6. A wheeled container for transporting fluid, comprising:

(a) a set of wheels;

(b) a support structure connected to said set of wheels and supported thereby in a given orientation during transporting; and

(c) liquid carrying structure supported by said support structure for providing a recirculating, closed passage for the liquid, said liquid carrying structure defining at least one closeable opening for introducing the liquid into the passage, said liquid carrying structure further defining said passage to be of a substantially uniform cross-sectional area, whereby surging effects of the liquid on the vehicle are minimized by the liquid circulating within said passage, wherein said liquid carrying structure defines first and second major portions of said passage to have axes substantially parallel to the direction of movement of the vehicle, and wherein said support structure supports said liquid carrying structure to maintain said axes in a non-horizontal plane when the support structure is in said given orientation during transporting.

4,241,756

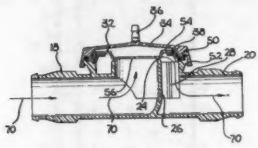
EXHALATION VALVE ASSEMBLY

Clifford D. Bennett, Alta Loma, and Charles Odenthal, Upland, both of Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Nov. 29, 1978, Ser. No. 964,682
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—496 **7 Claims**

1. A valve assembly for use in a volume ventilator, comprising:

(a) a valve body in part defining a pressure chamber;
(b) a gas inlet conduit joined to and in flow communication with said pressure chamber for directing a gas into said pressure chamber, said gas inlet conduit forming a discharge port in said pressure chamber;
(c) a gas outlet conduit joined to and in flow communication with said pressure chamber for directing gas out of said pressure chamber;
(d) diaphragm means removably disposed in and extending across said valve body adjacent said discharge port for selectively closing off said discharge port, said diaphragm means defining the remainder of said pressure chamber;

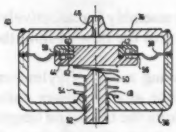


(e) a removably disposed ring member extending into said pressure chamber from a position adjacent the periphery thereof;
(f) a plurality of positioning members disposed on said body for positioning said ring member in said pressure chamber such that said ring member supports a predetermined portion of said diaphragm means; and
(g) a cover having a gas inlet joined to said valve body and extending across said diaphragm means on the opposite side thereof from said pressure chamber.

4,241,757
FLOW REGULATOR

Dan Bron, 36 Palmach St., Haifa, Israel

Continuation-in-part of Ser. No. 811,150, Jun. 28, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,173
Int. Cl.³ G05D *7/01*
U.S. Cl. 137—501 **5 Claims**

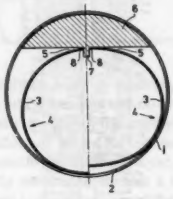


1. A fluid flow control unit adapted to be connected to a source of fluid under pressure, said unit comprising:
a housing having an input port and an output port:
a two-part body suspended in said housing by means of a diaphragm dividing said housing into an input chamber and an output chamber wherein said body is moveable in relation to said ports under the influence of the fluid pressure differential between said input chamber and said output chamber for variably restricting said output port under the displacement of said body toward said output port;
a tortuous passageway including a plurality of turns, a radially extending portion and flow restricting means formed in at least one part of said body, said passageway passing through said body between non-linearly aligned inlet and outlet openings for fluid communication between said input and output chambers via said body, the dimensions of which passageway remain unchanged during operation; and
resilient means for biasing said body toward said input port;
whereby the flow of fluid through said output port is controlled at a constant rate by said movable body and resilient means despite variations in the fluid pressure at, at least, one of the ports.

4,241,758
PRESSURE VALVE, ESPECIALLY FOR ROTARY PISTON COMPRESSORS

Dankwart Eiermann, Lindau, Fed. Rep. of Germany, assignor to Borsig GmbH and Wankel GmbH, both of Berlin, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,533
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757490
Int. Cl.³ F16K *15/14*; F04C *29/08*
U.S. Cl. 137—512.15 **5 Claims**



1. A pressure valve, especially for rotary piston compressors, which includes: a valve housing in the form of a cylindrical sleeve provided with through-flow opening means, closure means arranged in said sleeve opposite said opening means and comprising a pre-bent curved pre-loaded lattice-shaped metal sheet with parallel longitudinal strips forming resilient lamellae having its ends respectively interconnected by rim strips, said lamellae being operable selectively to be moved into a valve closing position in which said lamellae tightly close said throughflow opening means and also into a valve opening position in which said lamellae uncover said through-flow opening means, and vice versa, and abutment means arranged inwardly of said sleeve and located opposite said through-flow means in spaced relationship thereto, said rim strips having their ends resting against said abutment means, and said closure member in said opening position resting against two nearly diametrically oppositely located areas of the inner wall of said sleeve.

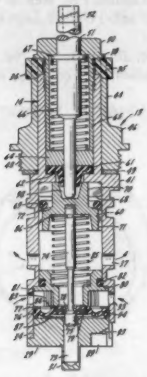
4,241,759
SLOW CLOSING FAUCET

Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Aug. 28, 1978, Ser. No. 937,045
Int. Cl.³ F16K *11/18, 31/12*
U.S. Cl. 137—636.4 **8 Claims**

1. In a slow closing faucet, a hollow casing with a pair of inlets and an outlet therein, a cartridge core having a plurality of inlets and outlets insertable and positioned in the casing, said casing inlets in communication with said core inlets and said core outlets in communication with said casing outlet, a bonnet on the top of the casing holding the core in position in the casing, an operating stem extending through the bonnet into the core and an operating knob attached to the top of the stem for manual manipulation, a cover on the top of the core having an opening through which the operating stem extends, means to hold the operating stem in the core, an inner ledge formed inside the core, a restoring spring positioned between the stem holding means and the inner ledge to normally bias the operating stem towards the cover, a sealing member around the operating stem and resting against the top of the inner ledge with the operating stem extending therethrough, a piston slidably mounted in the core below the inner ledge, a valve stem

in the core below the piston and having its upper end in engagement with the underside of the piston, a second spring in the core normally biasing the piston and valve stem upwardly so that the upper end of the piston will be against the bottom of the inner ledge and in engagement with the bottom end of the operating stem, a valve below the piston and operatively related to the lower end of the valve stem for controlling the flow of water between the core inlets and outlets, sealing means around the piston, and a restricted bypass between the



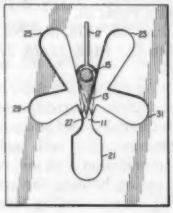
sealing means and the piston such that upon manual operation of the knob causing depression of the operating stem, the piston and the valve stem are moved downwardly thereby opening the valve, said sealing means being movable in a chamber formed between said core, said piston and said bottom of said inner ledge to allow unrestricted flow into said chamber, release of said knob allowing said piston to move upwardly, said seal means movable in said chamber to restrict flow out of said chamber only through said restricted bypass, to allow slow closing movement of said faucet.

4,241,760

FLUIDIC VALVE

George Mon, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 1, 1979, Ser. No. 8,627
Int. Cl.³ F15C *3/00*
U.S. Cl. 137—829 **6 Claims**



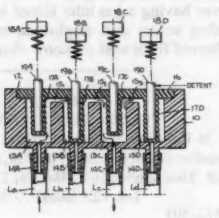
1. A fluidic flow diverter comprising:
a substantially rigid body;
a supply nozzle for discharging a fluid power stream formed in said body;
a pair of outlet channels formed in said body for receiving the power stream
a pinstably mounted tapered rigid control member disposed inside the power nozzle in a first position so that it splits the power stream evenly and fluid exists via the two outlet channels with equal pressures;
a plurality of vents for exhausting fluid overspill from the outlet channels disposed between the supply nozzle and the outlet channels, and
turning means responsive to an external input signal for causing the rigid control member to be displaced from said first position so that fluid exits via the two outlet channels with a pressure differential proportional to the displacement of said member being produced across the outlet channels.

4,241,761

MANIFOLD VALVE ASSEMBLY

William Miller, Westport, Conn., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Filed Jan. 9, 1979, Ser. No. 2,027
Int. Cl.³ F16K *11/20*
U.S. Cl. 137—883 **8 Claims**



1. A manifold valve assembly for selectively interconnecting a group of lines to control the flow of fluid therethrough, said assembly comprising:
A a valve block having a row of cylinders formed therein which communicate at their lower ends with a row of ports projecting from the block and coupled to the respective lines in the group, the junction of said ports and cylinders defining valve seats, the upper ends of the cylinders being interconnected whereby fluid admitted into any cylinder in the row thereof flows into the other cylinders;
B a corresponding row of axially-expandable tubular nipples coaxially supported within the respective cylinders to define fluid chambers therein, said nipples having a normal length terminating at a first point that falls short of said valve seats, whereby each cylinder and nipple define a normally-open valve; and
C a row of push-button actuated push rods projecting into said nipples; the buttons in the row having normally raised positions; each rod, when pushed in by pressing its associated button, acting to axially expand the related nipple to a second point in sealing engagement with the valve seat of the cylinder to close the valve, the rod being detented at said second point to maintain the associated button at a depressed position whereby when the associated button is again pressed to release the detent, it returns to its raised position at which the valve is open, the buttons in the row therefore being indicative of the status of the valves.

4,241,762

COMPOSITE UNDERGROUND FLUID CONDUIT OF CONCRETE AND STEEL SECTIONS

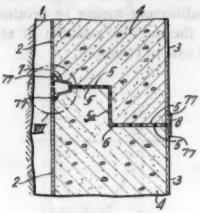
Heinz Link; Heribert Schupp, both of Oberhausen, and Heinz Lendla, Duisburg, all of Fed. Rep. of Germany, assignors to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

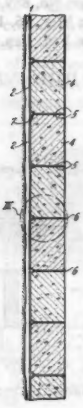
Filed Feb. 27, 1979, Ser. No. 15,628

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808387

Int. Cl.[3] F16L *1/00*

U.S. Cl. 138—105 11 Claims





1. A composite underground shaft lining assembly particularly for use as a leakproof water conduit comprising: a plurality of individual annular concrete sections arranged in a generally aligned relationship to form a composite concrete cylinder, said composite concrete cylinder having an inner cylindrical surface and an outer cylindrical surface; joint means interposed between said annular sections joining said sections together, said joint means being composed of an intermediate layer of flexible material imparting a degree of flexibility between said individual concrete sections; a composite steel cylinder arranged about said outer cylindrical surface of said composite concrete cylinder; said composite steel cylinder comprising a plurality of individual annular steel sections and spring rings connected between adjacent steel sections in a water-tight manner joining said sections together to form said composite steel cylinder; said spring rings being located adjacent each of said joint means at said outer cylindrical surface of said composite concrete cylinder.

4,241,763

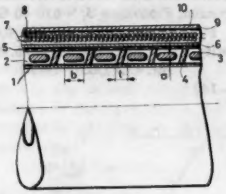
RUBBER HOSE WITH SPIRAL FIBER REINFORCING CORE

Sandor Antal; Zoltan Bartha; Peter Gorgenyi; Nandor Meitzen, and Mihaly Arvai, all of Budapest, Hungary, assignors to Taurus Gumilpari Vallalat, Budapest, Hungary

Continuation of Ser. No. 837,868, Sep. 29, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 3,769

Int. Cl.[3] F16L *11/00, 9/00*

U.S. Cl. 138—127 2 Claims



1. In a flexible rubber hose comprising an outer rubber cover, a reinforcing fabric beneath the cover, and a metal wire reinforcement beneath the fabric; the improvement comprising a cushion layer reinforced with fabric beneath the wire reinforcement, and, beneath the cushion layer, a layer of rubber having at least partly embedded therein a helical core whose turns are spaced apart in the direction of the length of the hose by portions of said layer of rubber, the helical core consisting of reinforcing fibers embedded in thermoset synthetic resin, the cross-section of material of the helical core being flattened, the cross-section of the helical core having a length in the direction of the length of the hose which is at least 1.4 times the thickness of the cross-section of the helical core in a direction radially of the hose.

4,241,764

SAND ROLLER CONTROL MECHANISM FOR LOOMS

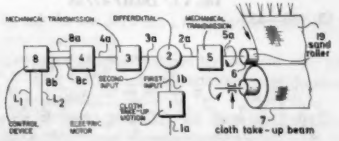
Jan Foltyn; Jindrich Henzl; Otto Rotrekl, all of Brno, and Vladimir Kuda, Blazovice, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vaseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 857,708, Dec. 5, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,642

Claims priority, application Czechoslovakia, Dec. 3, 1976, 7871-76

Int. Cl.[3] D03D *49/20*

U.S. Cl. 139—1 R 3 Claims



1. In a loom provided with a drive shaft driven in synchronism therewith, the loom having a cloth take-up motion, a sand roller, and a cloth take-up beam, the improvement which comprises a control mechanism for the sand roller, said control mechanism comprising a differential gearing mechanism having first and second input shafts and an output shaft, the first input shaft of the differential gearing mechanism is drivingly connected to the cloth take-up motion, an electric motor having an output shaft, means drivingly connecting the output shaft of the motor to the second input shaft of the differential gearing mechanism, means drivingly connecting the output shaft of the differential gearing mechanism to the sand roller, a source of electric power, and a mechanism for controlling the electric motor comprising circuit means for connecting the

electric motor comprising circuit means for connecting the electric motor to the source of electric power when the loom is stopped, so that the sand roller is then driven only by the electric motor, and means for disconnecting the electric motor from the source of electric power during normal operation of the loom, so that the electric motor is then at rest and the sand roller is driven only by the said drive shaft of the loom.

4,241,765

SHUTTLE DRIVE ARRANGEMENT

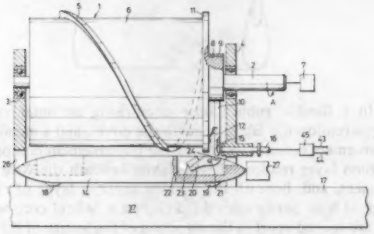
Gert E. A. Franzen, Pionvägen 3, S-610 40 Gusum, Sweden

Filed Feb. 1, 1979, Ser. No. 8,418

Claims priority, application Sweden, Feb. 8, 1978, 7801457

Int. Cl.[2] D03D *49/28*

U.S. Cl. 139—142 **7 Claims**



1. A shuttle-drive arrangement for a weaving loom, comprising at least one drive rotor (1) having a helical driving means (5) arranged to co-act with a shuttle-dogging device (23) for driving a shuttle (14) across the loom, characterized in that the rotor (1) is arranged to be continuously rotated by a drive source (7); that means (8,9,10; 51,52) are arranged to indicate the rotary position of the rotor and the driving means; and that when the driving means is located in a given position for driving the shuttle, a coupling mechanism (20,24; 23,53) is arranged to be activated to an operative state for coupling the dogging device (23) to the driving means (5).

4,241,766

SELECTIVE WEFT INSERTING APPARATUS IN SHUTTLELESS WEAVING LOOM

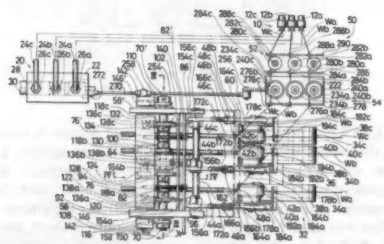
Masayuki Ushiro, and Haruo Shimazaki, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 16, 1979, Ser. No. 4,058

Claims priority, application Japan, Jan. 17, 1978, 53-2649

Int. Cl.[3] D03D *47/38*

U.S. Cl. 139—435 **6 Claims**



1. An apparatus for selectively inserting weft yarns each into a shed of warp yarns in accordance with a predetermined weaving schedule in a shuttleless loom, comprising weft inserting means operative to insert a selected one of the weft yarns into the shed of warp yarns when actuated, conditioning means for producing conditions in which a selected weft yarn is to be inserted into the shed, at least two cam shafts axially aligned with each other and rotatable independently of each other in both directions about the respective center axes of the shafts in accordance with said weaving schedule, cams rotatable with and arranged axially of each of said cam shafts, levers rockable about an axis of rotation substantially parallel with the center axes of said cam shafts and each engageable with at least one of the cams on said cam shafts, the levers being driven to rock about said axis of rotation selectively depending upon the respective rotational positions of the cam shafts about said center axes, and mechanical linkage means operatively intervening between said levers and said conditioning means for enabling the conditioning means to produce said conditions depending upon the angular position of at least one of said levers about said axis of rotation.

4,241,767

METHOD AND DEVICE FOR FEEDING WEFT WIRES

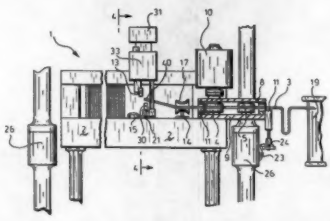
Hans Laddach, and Werner Oertel, both of Dusseldorf, Fed. Rep. of Germany, assignors to Hein, Lehmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 859,430, Dec. 12, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,579

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656188

Int. Cl.[3] D03D *47/12*

U.S. Cl. 139—443 **5 Claims**



1. A fill wire feeder mountable on one end of a movable lay beam, comprising:

a weft wire feeding mechanism including at least one pair of cooperating, force-adjustable generally cylindrical rollers, the axes of which lie in one plane, said rollers being mounted so as to be in constant communication with weft wire fed therebetween and at least one of said rollers being mounted in a fixed position, said feeding mechanism also including drive means including an electric motor coupled to said at least one roller for intermittently driving the same; and

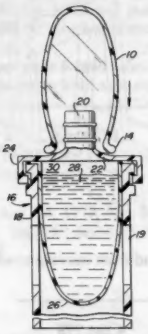
a cutting device including a weft wire tubular guiding piece for receiving weft wire from said feeding mechanism and two counter-moving and coacting knives, said knives being mounted for movement on said lay beam in a direction parallel to each other and perpendicular to said lay beam and drive means for moving said knives during the engagement of the lay beam so as to cut weft wire moved therebetween by said feeding mechanism, said counter-moving knives of said cutting device have a point of intersection which is located above the opening cross-section of said guiding piece so that simultaneously with the cutting operation one end of the weft wire is bent.

4,241,768

INFANT BOTTLE AIR REMOVAL MEANS

Charles Keller, 4625 Ella St., Philadelphia, Pa. 19120, and Paul Maria, 1402 Schwenkmill Rd., Perkasie, Pa. 18944

Filed Jul. 18, 1979, Ser. No. 58,576
Int. Cl.³ B67C 9/00
U.S. Cl. 141—8 **5 Claims**



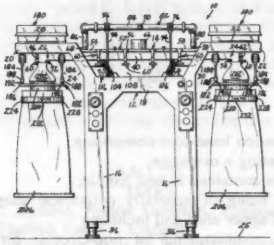
5. A method of removing air from an air pocket above a liquid in a collapsible liner in an infant bottle comprising the steps of collapsing a hollow vessel of resilient material, inserting the nipple into a hole in said vessel, holding the periphery of the hole in sealing contact with a nipple support portion, then allowing the vessel to expand, using the expansion of said vessel to suck air out of said pocket by way of a slit in the nipple, whereby air from said pocket is removed without contacting the liner, then removing said nipple from said vessel.

4,241,769

VIBRATING CONVEYOR FOR USE WITH PACKAGING APPARATUS

Dale E. Wiesner, Box 36A, Bancroft, Wis. 54921

Filed Feb. 8, 1979, Ser. No. 10,482
Int. Cl.³ B65B 1/28, 1/32
U.S. Cl. 141—83 **23 Claims**



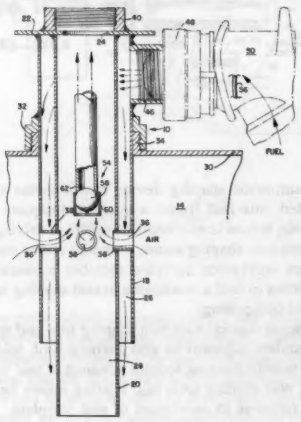
1. A vibrating conveyor for conveying material comprising:
a conveying table, said table having an inlet area disposed generally in the middle of said table for receiving particulate material to be conveyed, a first outlet disposed on a first side of said table and a second outlet disposed on a second opposed side of said table;
means for supporting said table for vibratory motion;
a first pneumatic linear vibrator coupled to said table on said first side for vibrating said table and for conveying particulate material from said inlet area to said second outlet;
a second pneumatic linear vibrator coupled to said table on said second side for vibrating said table and for conveying particulate material from said inlet area to said first outlet;
each linear vibrator including a housing and a piston movably carried therein for motion in a linear direction forming the line of impact of a respective piston;
means for mounting said first linear vibrator to said table in a disposition such that the line of impact of the first vibrator's piston slants generally upward from said first side of conveying table toward said second side thereof;
means for mounting said second linear vibrator to said table in a disposition such that the line of impact of the second vibrator's piston slants generally upward from said second side of said conveying table toward said first side thereof;
wherein in each vibrator the piston has a mass at least as large as the mass of the housing; and
means for controlling the application of fluid pressure to said first and second linear vibrators whereby the application of fluid pressure to one of said vibrators can be stopped and the application of fluid pressure to the other of said vibrators immediately initiated to quickly reverse the direction of conveying.

4,241,770

FUELING UNIT APPARATUS

Joseph D. Robertson, Butte, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed Oct. 24, 1978, Ser. No. 954,292
Int. Cl.³ B65B 3/18, 3/26
U.S. Cl. 141—198 **9 Claims**



1. A fueling unit for use between a receiver, an inlet line, and a vent assembly comprising:
(a) a double-walled member formed by an inner wall member and an outer wall member insertable into an opening in the top of a receiver;
(b) means for sealingly mounting the outer wall member in said opening so that the member extends externally as to the receiver;
(c) means for connecting an inlet line to that portion of the outer wall member which is external to the receiver;
(d) a first passage within the inner wall member adapted to communicate the vent assembly and receiver;
(e) a second passage between the inner and outer wall members;
(f) means for supporting said inner and outer wall members so that said inner wall member extends externally as to the receiver and closing one end of said second passage, said second passage then communicating said inlet line and receiver;
(g) means for connecting a vent assembly to that portion of the inner wall member which is external to the receiver;
(h) at least one port which communicates the interior of the

receiver with the first passage through bores in both the inner and outer wall members;

(i) sensor means in the inlet line responsive to a level of vapor pressure for interrupting fuel flow to the receiver; and,

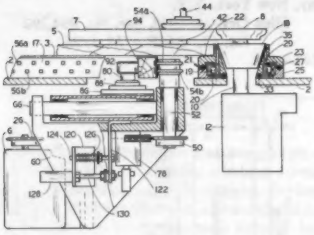
(j) valve means in the vent assembly which is adapted to close when the receiver is filled with fuel to a desired level to activate the sensor means to increase in vapor pressure within the receiver at a value commensurate with the level of fill which shall at least equal a value of vapor pressure to which the sensor means responds.

4,241,771

BEARING ASSEMBLY FOR AN AUTOMATIC SHAPING DEVICE

Arthur J. Rhodes, 2606 Benoch, and William J. Rhodes, 3343 Camp Ground Rd., both of, Louisville, Ky. 40216

Filed Jan. 8, 1979, Ser. No. 1,522
Int. Cl.³ B23C *1/18*; B27C *5/02*
U.S. Cl. 144—145 A **5 Claims**



1. In an automatic shaping device that includes a frame, a table mounted onto said frame, a movable template mounted onto said table, means to move said template in driving relation with said template, shaping means mounted above said table, a power-driven workpiece carrying member mounted to said table, and means to feed a workpiece to said shaping means, the improvement comprising:

bearing means coaxial with said shaping tool and supporting said template adjacent to said shaping tool, said bearing means including means to limit advance of said workpiece toward said shaping tool, said bearing means being movable in response to movement of said template.

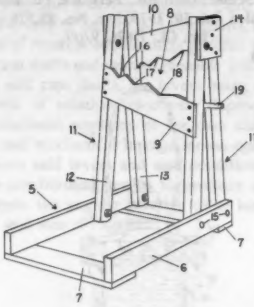
4,241,772

SAWBUCK

Fred F. Scherer, Frendship, Me. 04547

Filed Aug. 23, 1978, Ser. No. 936,014
Int. Cl.³ B25H *1/06*
U.S. Cl. 269—289 R **9 Claims**

1. A sawbuck including an elongated base, upper and lower jaws, means connecting said jaws to one end of said base transversely thereof with said jaws spaced a substantial distance above said base and with the vertical distance between the jaws increasing from a minimum adjacent one side of the base to a maximum adjacent the other side thereof thereby to accommodate ends of logs or split sections thereof within a substantial range of cross sectional sizes and shapes, the upper jaw spaced closer to said one end of the base than the lower jaw whereby when the end of a log or a section thereof that is to extend over the base towards the other end thereof is inserted between the jaws where the vertical dimensions of said end are approximately equal to the vertical spacing of the jaws and then released, said log or sections thereof is held as a cantilever with a substantial unobstructed space between it and said base, and at least one of said jaws including fixed means to



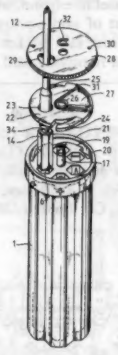
hold the thus entered end from moving towards said other side of the base.

4,241,773

COMBINATION HAND-TOOL

Patrice Personnat, Chateau Perigord, Monte-Carlo, Monaco

Filed Feb. 16, 1979, Ser. No. 12,768
Claims priority, application France, Feb. 21, 1978, 78 05148
Int. Cl.³ B25G *1/08*
U.S. Cl. 145—63 **4 Claims**



1. A combination hand-tool comprising

a handle forming a magazine,

tool elements contained in said handle,

said handle being of generally cylindrical shape having lower and upper ends and including

longitudinal compartments of non-circular cross-section formed around the axis of said handle and opening toward said upper end,

first and second cover-forming plates forming an upper plate and an intermediate plate respectively and mounted for rotation about the axis of said handle at said upper end of said handle,

each of said plates having an aperture therein,

said aperture of said intermediate plate located to register with any one of said compartments,

said aperture of said upper plate having a portion capable of moving into a position coaxial with any one of said compartments and an adjoining portion of smaller diameter,

means to step the rotation of said cover-forming plates to permit said aperture of said intermediate plate to register with each of said compartments,

each of said tool elements including

a shank of substantially the same shape as each of said compartments and of greater cross-section in at least some part than said aperture of said upper plate,

a groove in each of said tool elements located to receive said adjoining portion of smaller diameter of said aperture of said upper plate,

means to hold each of said tool elements extracted from its compartment in the extracted position by holding said adjoining portion of smaller diameter in said groove of said tool element,

whereby said upper plate is held relative to said intermediate plate by said means to hold said extracted tool elements.

4,241,774

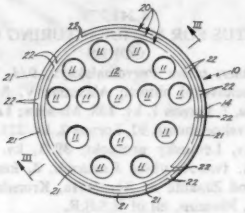
GOLF TUBE SEPARATOR INSERT

Terrell G. Pell, 2701 McIntosh, NE., Grand Rapids, Mich. 49505

Filed Aug. 16, 1979, Ser. No. 67,054

Int. Cl.³ A63B *55/00*

U.S. Cl. 150—1.5 R **19 Claims**



1. A golf tube separator insert for golf bags comprising:

a disc having top and bottom surfaces and a peripheral edge joining same, said disc being made of a material which is semi-rigid such that it will hold a disc-shape configuration and won't distort under normal use, but which is compressible such that said disc can be compressed at least somewhat to accommodate different sized and shaped openings in the top of different golf bags; a plurality of holes in said disc adapted to receive golf club separator tubes; at least one perforation line defined by a series of cuts serially spaced by small bridges of disc material between successive cuts, said cuts extending from said top to said bottom of said disc, said perforation line defining a closed loop and being spaced inwardly from said peripheral edge of said disc whereby a portion of said disc can be broken away at said perforation line and the range of sizes of golf bags into which said disc can be fitted is increased.

4,241,775

TIRES

William L. Jackson, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

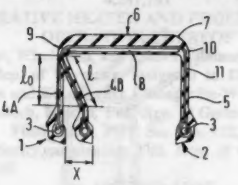
Filed Aug. 16, 1978, Ser. No. 934,277

Claims priority, application United Kingdom, Aug. 25, 1977, 35662/77

Int. Cl.³ B60C *5/02, 13/00, 17/04*

U.S. Cl. 152—330 RF **52 Claims**

1. A tire and wheel assembly comprising a wheel rim including two circumferentially-extending bead seats and a tire comprising two circumferentially-extending bead regions each retained upon a respective bead seat by a continuous bead ring which is substantially incapable of circumferential expansion or compression, a circumferentially-extending tread which is capable of resisting circumferential expansion but capable of local radial deflection, and two load-carrying sidewalls each having a radially-innermost edge and a radially-outermost edge, the radially-outermost edge being attached to a respective edge of the tread and the radially-innermost edge being attached to a respective bead region, each sidewall including tension-resisting reinforcements extending between said edges and being capable of being placed in tension, and pretensioning



means, including means to relatively move the rim bead seats and therefore the tire bead regions for placing said tension-resisting reinforcements in tension after the tire has been built and before the tire is loaded.

4,241,776

TIRE AND WHEEL ASSEMBLIES

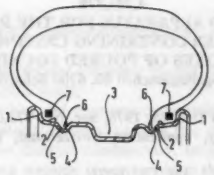
Charles G. Stewart, Warwickshire, England, assignor to Dunlop Limited, London, England

Filed Jan. 17, 1979, Ser. No. 4,261

Claims priority, application United Kingdom, Jan. 21, 1978, 2512/78; Feb. 14, 1978, 5786/78

Int. Cl.³ B60B *21/10*

U.S. Cl. 152—381.4 **14 Claims**



1. A one piece wheel rim comprising a pair of spaced-apart flanges, a tire bead seat adjacent each flange, a tire fitting well, and immediately adjacent at least one of the bead seats between the bead seat and the fitting well a circumferentially extending groove formed so as to be able to accommodate an extended bead retaining toe of a tire and means to prevent inflation of a tire which is incorrectly fitted or is not configured for said rim, said means comprising at least one discreet air pressure release passage extending from a point within the groove and positioned such that the point is covered by a correctly fitted extended bead retaining toe.

4,241,777

PORTABLE SHELL

Jerry A. Wenger, Owatonna; Herman A. Clausen, West Concord; David R. Boeddeker, Owatonna, and Harvey M. Urch, West Concord, all of Minn., assignors to Wenger Corporation, Owatonna, Minn.

Continuation of Ser. No. 825,065, Aug. 16, 1977, abandoned. This application Apr. 27, 1979, Ser. No. 34,002

Int. Cl.³ A47G *5/00*

U.S. Cl. 160—135 **16 Claims**

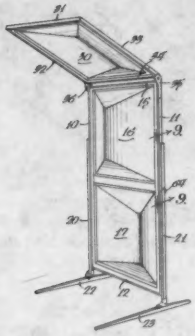
1. A lightweight portable shell comprising:

a framework with panel means supported by frame members including a pair of spaced-apart side frame members;

a supporting leg structure including a pair of legs and each having a foot at an end thereof; and

means for detachably locking said legs (a) one to each side

frame member at any one of several different operative positions along the length of the side frame member to extend from the side frame member selectively different amounts dependent on the desired height of the shell, and (b) one to each side frame member opposite the one to



which the leg is secured in the operative position to be in side-by-side substantially coextensive storage positions therewith, said locking means comprising means for preventing separation of the framework from the legs notwithstanding lifting of the assembled shell structure in any direction.

4,241,778

METHOD AND APPARATUS FOR THE REMOVAL OF SAND BALES CONTAINING CASTINGS FROM MOLDING BOXES OF POURED FOUNDRY MOLDS

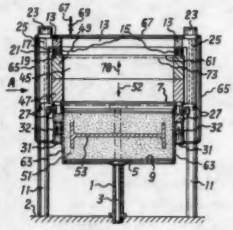
Erwin Bührer, Vögelingässchen 40, 8200 Schaffhausen, Switzerland

Filed Dec. 26, 1978, Ser. No. 973,027

Claims priority, application Switzerland, Dec. 27, 1977, 16036/77

Int. Cl.³ B22D *29/02*

U.S. Cl. 164—131 **10 Claims**



1. A method for removing sand bales containing castings from molding boxes of poured foundry molds comprising the steps of: clamping said molding boxes together in a horizontal position; supporting said sand bales from below with a predetermined supporting force independently of said molding boxes, said predetermined supporting force being provided for at least a portion of the weight of said sand bales; applying to said molding boxes in a direction generally aligned with the walls thereof accelerative forces acting in a vertical direction while maintaining said supporting force for said sand bales, said accelerative forces being applied temporarily in a direction only which is opposite to a force resulting from the weight of said sand bales and said predetermined supporting force and being of a magnitude exceeding the magnitude of static frictional forces between said sand bales and said molding boxes in order to cause said sand bales to move out of said molding boxes; and removing said sand bales from said molding boxes.

4. Apparatus for removing sand bales containing castings from molding boxes of poured foundry molds comprising: means for clamping said molding boxes together in a horizontal position so that the walls thereof are situated in generally vertical planes; means for supporting said sand bales from below independently of said molding boxes, said support means being vertically movable in a predetermined direction and operating to provide support for at least a portion of the weight of said sand bales; and means vertically aligned with the walls of said mold boxes for applying to said molding boxes in a vertical direction temporarily acting accelerative forces of a magnitude exceeding static frictional forces between said sand bales and said molding boxes while said sand bales are being supported by said supporting means to cause said sand bales to move out of said molding boxes, said means for applying said accelerative forces being operable in one direction only which is opposite to said predetermined direction of said support means.

4,241,779

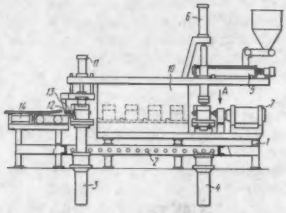
APPARATUS FOR MANUFACTURING FOUNDRY CORES

Vitaly A. Zitser, ulitsa Pervomaiskaya, 9/4, kv. 17, Dolgoprudny Moskovskoi oblasti; Alexandr V. Melnikov, ulitsa Dorozhnaya, 7, korpus 1, kv. 138, Moscow; Leonid V. Bachelis, Schelkovskoe shosse, 91, korpus 2, kv. 221, Moscow; Jury E. Morozov, Leninsky prospekt, 39/1, kv. 264, Moscow; Vladimir A. Ivanov, ulitsa Rustaveli, 3, korpus 6, kv. 34, Moscow, and Zinaida A. Abramova, Kronshtadtsky bulvar, 57, kv. 110, Moscow, all of U.S.S.R.

Filed Aug. 7, 1979, Ser. No. 64,508

Int. Cl.³ B22C *13/12*

U.S. Cl. 164—207 **2 Claims**



1. An apparatus for manufacturing foundry cores by pressing a fluid sand into heated core boxes, comprising:

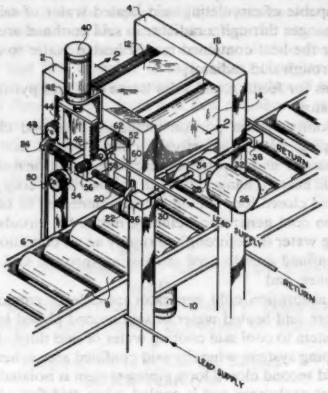
a tiered supporting frame; a transportation means and transfer tables mounted on a bottom tier of said supporting frame; a sand preparation and a pressing mechanism and a pusher with a crosspiece, mounted on an upper tier of said supporting frame; a heating chamber for receiving core boxes pushed by said pusher; a set of core boxes; a device for fastening halves of the core boxes, located before said heating chamber; a device for unfastening the halves of the core boxes, mounted after said heating chamber; each of said core boxes having two horizontal rods with conical elements, located in the bottom half of the core boxes and cooperating with said devices for fastening and unfastening the halves of the said core boxes, and two vertical rods mounted on the top half of said core boxes, having at the bottom ends thereof slots and conical orifices for cooperating with the conical elements of the horizontal rods; a mechanism for disassembling core boxes mounted after said heating chamber; and a mechanism for delivering finished cores, placed on an upper tier of said supporting frame.

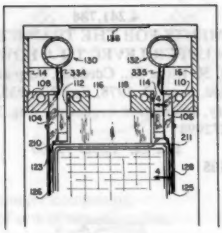
4,241,780

APPARATUS FOR FORMING BATTERY STRAPS AND INTERCELL CONNECTIONS

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Dec. 20, 1976, Ser. No. 752,644
Int. Cl.³ B22D 19/04, 39/02
U.S. Cl. 164—333 2 Claims





1. An apparatus for automatically casting the straps and intercell connections of a lead-acid storage battery containing a battery case and a plurality of cellular partitions, comprising:

(a) work surface having a processing position thereon for receiving open top battery cases having a plurality of stacks of positive and negative plates in the cells thereof, said plates each having protruding lugs formed thereon;

(b) mold means located at said processing position for selectively defining molding channels around rows of positive and negative lugs of said stacks within said case, said mold means comprising a plurality of dams for forming the surfaces of a mold with at lest one dam movable in relation to the remaining dams;

(c) translating means connected to said mold means for moving the movable dam portion of the mold;

(d) casting means associated with said mold means at said processing position movable between a standby position for allowing molten lead to circulate therethrough and a pouring position for simultaneously introducing molten lead into said molding channel to cast the straps and intercell connections of said battery;

(e) rotating means connected to said casting means for selectively moving said casting means between said standby position and said pouring position;

(f) at least one molten lead supply means connected to said casting means for supplying molten lead to said casting means; and

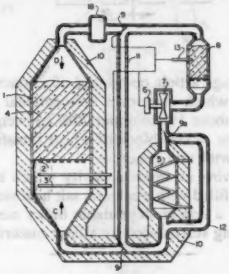
(g) at least one molten lead return means connected to said casting means for receiving and returning uncast molten lead from said casting means to at least a portion of said supply means.

4,241,781

REGENERATIVE HEATER AND PROCESS FOR THE OPERATION THEREOF

Axel Eschner, Wiesbaden, and Erich Pöhlmann, Kulmbach, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden and Kulmbacher Klimageräte-Werk GmbH & Co. KG, Kulmbach, both of, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,431
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731115
Int. Cl.³ F28D 17/00
U.S. Cl. 165—1 31 Claims



24. A process for regeneratively heating gas, said process comprising:

providing a regenerator container having opposite ends and air-impermeable walls;

positioning within said regenerator container a fill of heat retaining material comprising solid fine granular particles having a low thermal conductivity, such that said fill of heat retaining material is permeable to the passage therethrough of air, throughout the entire length thereof taken in opposite directions between said open opposite ends of said regenerator container;

positioning a heat source adjacent a first end of said fill of heat retaining material;

circulating a charging first flow of gas in a first direction through said fill of heat retaining material, such that said charging flow of gas is heated by said heat source and then passes through the entire length of said fill of heat retaining material, from said first end thereof to a second opposite end thereof, and across substantially the entire cross-section thereof, while transferring heat to said fill of heat retaining material;

circulating a discharging second flow of gas in a second direction opposite to said first direction through said fill of heat retaining material, such that said discharging flow of gas passes through the entire length of said fill of heat retaining material, from said second end thereof to said first end thereof, and across substantially the entire cross-section thereof, while receiving heat from said fill of heat retaining material;

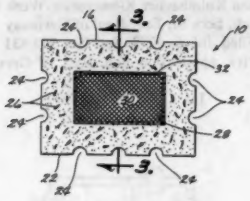
entirely enclosing said charging and discharging flows of gas to flow in a completely closed circulation path including the interior of said regenerator container; and

said steps of circulating said charging and discharging flows of gas comprising passing said charging and discharging flows of gas in opposite directions in said completely closed circulation path by reversibly operating a single blower positioned within said completely closed circulation path.

4,241,782
HEAT STORAGE SYSTEM ADAPTED FOR INCONGRUENTLY MELTING HEAT STORAGE MATERIALS AND CONGRUENTLY MELTING HEAT STORAGE MATERIALS

James L. Schoenfelder, 415 - 5th St., Coralville, Iowa 52241

Filed Nov. 30, 1978, Ser. No. 965,028
Int. Cl.³ F28D 17/00
U.S. Cl. 165—10 8 Claims



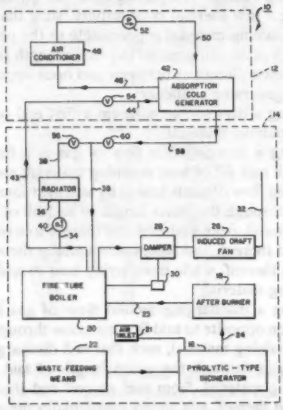
1. A heat storage article comprised of a concrete block, the composition of which comprises conventional masonry concrete and from about 5% to about 20% by weight of the fine aggregate portion of said block of a heat transfer augmenting material mixed with said concrete,

said block having an internal cavity which is substantially completely filled with a eutectic salt heat storage material, mixed with a non-biodegradable bulky material and the mixture being surrounded by a liner material.

4,241,783
HEATING AND COOLING SYSTEM

William A. Smith, Marysville, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 26, 1978, Ser. No. 919,030
Int. Cl.³ F25B 29/00; F23B 7/00
U.S. Cl. 165—48 R 2 Claims



1. A heating and cooling system utilizing solid waste for selectively heating and cooling a confined area, said heating and cooling system comprising:

a pyrolytic incinerator capable of combusting said solid waste, means for supplying outside air to said pyrolytic incinerator to support combustion of said solid waste in a low oxygen atmosphere and for exhausting through an exhaust duct of said pyrolytic incinerator after said combustion of said solid waste;

an afterburner in said exhaust duct of said pyrolytic incinerator capable of combusting waste gases which have become mixed with said outside air during combustion of said solid waste to further heat said outside air and waste gas combustion products;

a heat exchanger in said exhaust duct downstream of said afterburner capable of transferring heat of said outside air and said waste gas combustion products to heating water passing through said heat exchanger;

a heating system portion including a first closed loop piping system selectively connected to said heat exchanger and capable of circulating said heated water of said heat exchanger through a radiator in said confined area to transfer the heat contained in said heated water to air passing through said radiator;

means for feeding said solid waste into said pyrolytic incinerator;

a cooling system portion including a second closed loop piping system selectively connected to said heat exchanger and capable of circulating said heated water of said heat exchanger through an absorption cold generator;

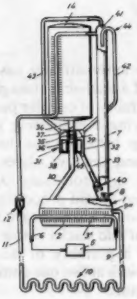
a third closed loop piping system connected to said absorption cold generator including means for circulating cooling water therethrough to supply an air conditioner in said confined area to cool air passing through said air conditioner; and

said absorption cold generator capable of employing heat from said heated water of said second closed loop piping system to cool said cooling water of said third closed loop piping system; whereby said confined area is heated when said second closed loop piping system is isolated from said heat exchanger and is cooled when said first closed loop piping system is isolated from said heat exchanger.

4,241,784
ARRANGEMENTS FOR THE TRANSFER OF HEAT FROM AN UPPER LEVEL TO A LOWER LEVEL

Victorio Tacchi, 50 Rioja St., Cordoba, Argentina

Filed Aug. 22, 1978, Ser. No. 935,848
Claims priority, application Argentina, Aug. 23, 1977, 268907; Jul. 18, 1978, 272998
Int. Cl.³ F28D 15/00
U.S. Cl. 165—105 5 Claims



1. A closed circuit arrangement for transferring heat from a first upper level to a second lower level by heating a liquid at the first level and causing it to flow through the second level, whereat the heat is extracted therefrom, back to the first level, the arrangement comprising a first chamber for housing an easily vaporizable liquid and defining said first upper level; a second chamber above said first chamber; means defining a communication for fluid flow from said first chamber to said second chamber and having a part thereof extending through said second lower level; means for heating and vaporizing the liquid when in said first chamber to cause the liquid or its vapor to flow through said lower level into said second chamber by effect of an increase in pressure in said first chamber; means

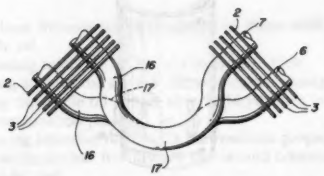
enabling said liquid to liberate heat at said second lower level; means defining a return path for liquid from said second chamber to said first chamber; and valve means interposed in said means defining the return path and adapted to intermittently permit the return of liquid from said second chamber to said first chamber wherein said valve means are first valve means adapted to intermittently permit the return of liquid from said second chamber to said first chamber each time the vapor pressure in the first chamber and which acts on said valve means is lower than the vapor and liquid pressures acting on said valve means from the second chamber, the arrangement further comprising means defining a communication for vapor flow from said first chamber to said second chamber; and a float valve in said communication for vapor adapted to open and permit flow of vapor from said first chamber to said second chamber only after accumulation of liquid in said second chamber, whereby upon opening of said float valve vapor pressure in said first chamber and said first valve means is opened by the pressure exerted thereon by the liquid accumulated in said second chamber.

4,241,785

HEAT EXCHANGERS AND METHOD OF MAKING SAME

Joseph M. O'Connor, Chicago, and Stephen F. Pasternak, Park Ridge, both of Ill., assignors to Peerless of America, Inc., Chicago, Ill.

Filed Jul. 24, 1978, Ser. No. 927,482
Int. Cl.[3] F28F *1/30*
U.S. Cl. 165—172 **10 Claims**



1. A heat exchanger comprising
a. a plurality of sets of one-piece fins,
b. tubes
(1) mounted in oppositely disposed marginal edge portions of each of said sets of fins and
(2) having portions extending between adjacent pairs of said sets of fins,
c. part of said portions of said tubes being disposed in substantially uniplanar relation to each other, and
d. said tubes being bent at said part of said portions in a direction transverse to the plane defining said uniplanar relationship to thereby dispose said adjacent pairs of sets of fins at an angle relative to each other which is less than 180 degrees.

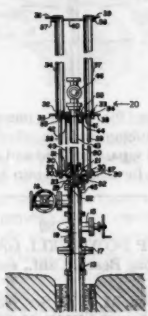
6. The method of making a heat exchanger comprising
a. forming two spaced fin assemblies, each having
(1) an opening formed in each of two oppositely disposed marginal edge portions thereof
b. forming two elongated, substantially straight tubes,
c. mounting said tubes in said fin assemblies, with
(1) one portion of each of said tubes mounted in a respective one of said openings in a respective one of said marginal edge portions of each of said fin assemblies, and
(2) another portion of each of said tubes extending between adjacent ones of said fin assemblies,
d. bending an intermediate portion of said other portion of each of said tubes inwardly toward the side of the space between said adjacent fin assemblies remote therefrom into position to dispose said intermediate portions, between said adjacent fin assemblies between which they extend, in uniplanar relation to each other in a direction transverse to the spacing between said one portions of said tubes disposed in opposite ones of said marginal edge portions, and
e. bending said tubes around said intermediate portions in a direction transverse to the plane defining said uniplanar relationship to thereby dispose said adjacent fin assemblies at an angle relative to each other which is less than 180 degrees, and
f. securing said tubes to said assemblies.

4,241,786

WELL TREE SAVER

Ronald S. Bullen, 98 Willow Park Green, SE., Calgary, Alberta, Canada

Filed May 2, 1979, Ser. No. 35,195
Claims priority, application Canada, May 2, 1978, 302475
Int. Cl.[2] E21B *19/00, 33/03, 43/26*
U.S. Cl. 166—77 **11 Claims**



11. Apparatus for inserting high-pressure fluid through a well tree having a vertical passage therethrough including at least one valve and into a well having well tubing aligned with said vertical passage, which apparatus comprises:
a piston rod removably mountable in a position offset from the vertical passage,
a piston fixed to the piston rod,
a cylinder movable on the piston,
a piece of high-pressure tubing mounted for movement with one of the cylinder and the piston rod and said high-pressure tubing being positioned for axial alignment with said vertical passage when said piston rod is mounted in said position,
the other of said cylinder and said piston rod being fixed relative to the well tree,
a high-pressure valve to selectively stop fluid flow through said high-pressure tubing, and,
sealing means adapted to prevent passage of fluid between the exterior of the high-pressure tubing and the interior of the vertical passage when said high-pressure tubing is inserted in said vertical passage.

4,241,787

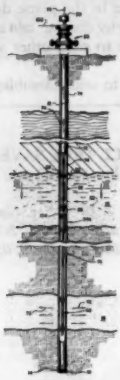
DOWNHOLE SEPARATOR FOR WELLS

Ernest H. Price, 1266 Pepper Dr., El Centro, Calif. 92243

Filed Jul. 6, 1979, Ser. No. 55,158
Int. Cl.[3] E21B *43/02, 43/38*
U.S. Cl. 166—105 **7 Claims**

3. Apparatus for producing oil and water separately from production fluid containing both oil and water in a well comprising a casing in the well, production tubing arranged in the casing and extending to the surface for conducting one of the fluids from the well to the surface, a packer between the tubing and the casing above the level of production of the fluids, conducting means for conveying fluid from the well below the

packer into the casing above the packer, the conducting means including a separator assembly for selectively passing one of the fluids and first and second pumps connected for receiving



the separated fluids and for pumping one of the separated fluids into the production tubing, and the other pump connected for receiving the second separated fluid and conveying it through a separate flow path for discharge into a disposal zone.

4,241,788

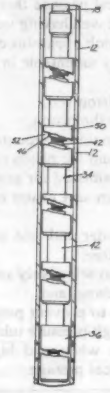
MULTIPLE CUP DOWNWELL GAS SEPARATOR

John R. Brennan, Long Beach, Calif., assignor to Armco Inc., Middletown, Ohio

Filed Jan. 31, 1979, Ser. No. 8,183

Int. Cl.[3] E21B *43/38*

U.S. Cl. 166—105.5 **10 Claims**



1. In a gas separator for a downwell pump for pumping well fluid;

(a) a plurality of upward opening retention cups disposed in vertical spaced relation one above the other, the diameter of each said retention cup being substantially larger than the diameter of the rest of said gas separator, each said retention cup forming a retention chamber having a fluid retaining capacity sufficient to momentarily retain well fluid so as to permit gas to escape from said fluid so retained and returned to said well;

(b) means defining a reservoir chamber disposed in spaced relation beneath said retention cups;

(c) means defining a first passageway adapted to provide fluid communication between said retention cups and said reservoir chamber;

(d) means defining a second passagway adapted to provide fluid communication from said reservoir chamber to the pump suction of said downwell pump; and

(e) means defining a third passageway providing communication between the interior and exterior of said reservoir chamber to allow gas contained thereto to escape therefrom and return to said well;

whereby said gas separator utilizes the difference in specific gravity between gassy well fluid and well fluid with gas removed to create circulation from said retention cup chambers to said reservoir chamber through said first passageway to provide a surplus of once separated well fluid so that the gaseous portion thereof will be discharged through said third passageway and back into said well fluid, the remainder being twice degassed fluid going to the pump suction of said downwell pump through said second passageway.

4,241,789

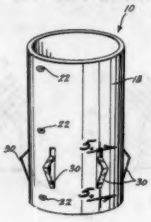
CONCRETE WALL CASING WITH CENTRALIZERS EMBEDDED THEREIN

Gottlieb W. Grosch, Silver Creek, Nebr. 68663

Filed May 12, 1978, Ser. No. 905,193

Int. Cl.[3] E21B *17/00*

U.S. Cl. 166—241 **3 Claims**



1. A concrete well casing, comprising,

a hollow cylindrical concrete casing member having upper and lower ends, inner and outer wall surfaces,

a plurality of elongated casing centralizers each having one end embedded in said concrete casing member, said centralizers being spaced around the circumference of said casing member and extending outwardly from said outer wall surface for engagement with the wall surface of the well to centralize the casing as it is lowered into the well,

said centralizers being initially substantially flush with the outer wall surface of said casing member but which may be deflected outwardly therefrom for engagement with the wall surface of the well bore hole to centralize said casing member with respect to said well bore hole,

each of said centralizers comprising elongated flat members having upper and lower ends, the lower end of said flat member being embedded within said casing member, said centralizer extending upwardly and outwardly with respect to the outer surface of said casing member, thence inwardly towards said casing member so that the upper end of said flat member engages the exterior surface of said casing member when said flat member has been deflected outwardly from said casing member.

4,241,790

RECOVERY OF CRUDE OIL UTILIZING HYDROGEN

Robert L. Magnie, 945 Detroit St., Denver, Colo. 80206

Filed May 14, 1979, Ser. No. 38,488

Int. Cl.[3] E21B *43/20, 43/24*

U.S. Cl. 166—260 **5 Claims**

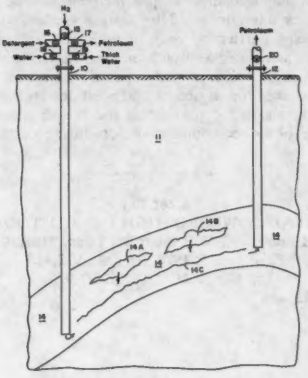
4. In an underground petroleum reservoir that is substan-

tially devoid of natural gas content, a method of increasing the flammability of the crude oil in place to facilitate the propagation of an underground fire flood comprising the steps of

establishing a first communication passage from the surface of the earth into the petroleum reservoir,

establishing a second communication passage from the surface of the earth into the petroleum reservoir, the second passage being spaced apart from the first passage,

injecting hydrogen into the first communication passage and into the petroleum reservoir in such quantity as to substantially saturate the crude in place with hydrogen, with the



resultant broadening of the limits of flammability of the crude oil,

terminating injection of the said hydrogen, then

injecting air into the second communication passage,

igniting the crude oil and its absorbed hydrogen in the first communication passage,

continuing injection of air with the resultant propagation of the underground fire toward the second communication passage, and

recovering petroleum and the products of combustion through the first communication passage.

4,241,791

METHOD FOR DIVERTING A GASEOUS SAND-CONSOLIDATING FLUID

David R. Davies, Rijswijk, Netherlands, and Edwin A. Richardson, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 1, 1980, Ser. No. 117,697

Claims priority, application United Kingdom, Jun. 26, 1979, 79222/79

Int. Cl.³ E21B *33/138, 43/02*

U.S. Cl. 166—292 **6 Claims**

1. A process, for consolidating or strengthening a gas-containing reservoir which has a layered permeability and is susceptible to impairment by liquid-blocking, comprising:

adjusting the water content of said reservoir to the extent necessary to wet the surfaces of the rock with a significant but limited amount of water;

injecting into the reservoir a sand consolidating gaseous solution which consists essentially of vapors of a silicon polyhalide, which has a water reactivity substantially equaling that of silicon tetrachloride, mixed with inert gas and is capable of causing a significant proportion of the rock-wetting water to be converted to a grain-bonding silica gel;

injecting, immediately ahead of at least a significant proportion of said sand consolidating gaseous solution, a permeability-adjusting smoke in which both the solid particles and the particle-suspending gas are substantially dry and are inert with respect to the hydrolyzing of a silicon polyhalide, at the temperature of the reservoir, with said smoke being injected so that most of the smoke particles are screened-out, in the form of permeability-impairing masses, along the faces of the more permeable layers of the reservoir; and,

subsequently removing said permeability-impairing masses of smoke particles by producing fluid from the reservoir.

4,241,792

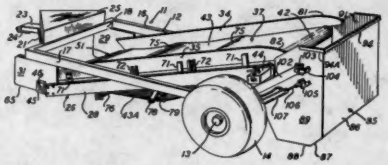
TRACTOR DRAWN GROUND SWEEPER

Donald K. Kratzer, P.O. Box 5, Geneseo, Kans. 67444

Filed Jan. 15, 1979, Ser. No. 3,267

Int. Cl.³ A01D *17/00*

U.S. Cl. 171—63 **9 Claims**



1. A ground sweeper to be towed behind a conventional hydraulically equipped and power take-off equipped power tractor and comprising a frame, outboard wheels journalled to the frame near the rear of the frame, a frame towbar tongue, a hydraulic fluid storage tank on the frame at the juncture of the frame and tongue; a moving screen carrier supported by the frame at an acute angle to the horizontal extent thereof and rising from tongue to wheels, transverse screen rollers at front and rear of the carrier, a moving endless screen supported from said screen carrier on said rollers, a hydraulic motor on said carrier adapted to drive said moving screen to run from rear to front of said sweeper, a hopper to receive sweepings from said moving screen, hopper mounts on said frame adapted to invert said hopper for dumping collected sweepings on the ground, frame mounted hydraulic means for actuating the inversion of said hopper; a transverse scoop removably fixed to said carrier at the front of said sweeper at a trailing vertical angle to the path of said sweeper, side plows at each side of said scoop extending in vertical plane along the path of said sweeper and supported by said frame; a hydraulic pump adapted to be carried by said towing tractor and further adapted to be connected operationally to said power take-off of the tractor, hydraulic lines from the hydraulic pump to the screen motor, hydraulic lines from the tractor hydraulic equipment to the hopper inversion means, and controls adapted to be mounted on said tractor to control flow of actuating hydraulic fluid to and from said hopper inversion means and said screen motor.

4,241,793

ROTARY HOE SCRATCHER

Murrell G. Watkins, Rte. 3, Box 92, Muleshoe, Tex. 79347

Filed Jan. 22, 1979, Ser. No. 5,146

Int. Cl.² A01B *21/04*

U.S. Cl. 172—551 **3 Claims**

1. On an agricultural draft vehicle having

a. a direction of draft,

b. a horizontal tool bar normal to the direction of draft, and

c. a plurality of rotary hoes, each including

(i) an axle,

(ii) a hub journalled to the axle, and

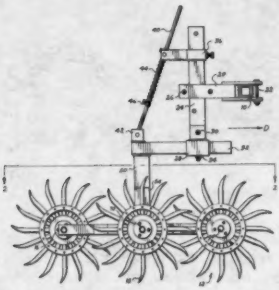
(iii) a plurality of tines in a plane radiating from the hub forming a diameter;

the improved structure for mounting the rotary hoes to the tool bar comprising:

d. a central carriage,

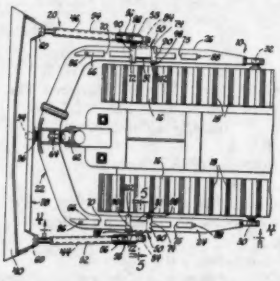
e. a central axle bolt having one of said axles on each end thereof extending through the carriage,

f. a pair of ears extending upward from the carriage straddling
g. a hoe shank connected to said tool bar,
h. at least one shank bolt connecting the ears to the shank,
j. a forward stub arm extending forward from the central carriage,
k. a rear stub arm extending rearwardly from the central carriage,
m. a forward arm bolted to the forward stub arm,
n. a forward axle bolt with
(i) one of said axles on one end thereof, and
(ii) the other end bolted to said forward arm,



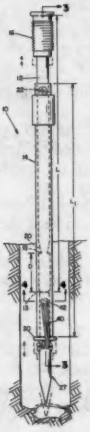
o. a rear arm bolted to the rear stub arm,
p. a rear axle bolt with
(i) one of said axles on one end thereof, and
(ii) the other end bolted to said rear arm,
q. so that
(i) the distance of the front axle bolt to the central axle bolt is the same as the distance of the rear axle bolt to the central axle bolt,
(ii) which distance is less than the diameter of the rotary hoes, and
(iii) the plane of the tines of each of the four hoes is spaced an equal amount from the plane of the next nearest hoe.

4,241,794
ANGLE DOZER ASSEMBLY
Francis J. Halterman, Jr., Hiram, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 13, 1979, Ser. No. 66,070
Int. Cl.[3] E02F *3/76*
U.S. Cl. 172—804 **2 Claims**



1. An angle dozer assembly for a tractor including a C-frame having a pair of laterally spaced arms located on opposite sides of the tractor, each of said arms having a pair of elongated guide tracks located along the longitudinal axis of said arm and formed on opposed surfaces thereof, a moldboard having the rear portion thereof connected to a forward central point of said C-frame for adjustable movement about a vertical axis, a thrust member extending rearwardly from each lower corner of the moldboard, a carriage mounted on each arm for connecting the rear of each thrust member to the C-frame, said carriage comprising a base member carried by the associated arm for movement along said guide tracks, each of said arms having at least three axially spaced and transversely extending slots formed on each of said opposed surfaces and serving as stations for locating the moldboard in an angled-left position, a straight-across position and an angled-right position, a manually removable U-shaped keeper member having a pair of parallel tines interconnected by a base section, said keeper member being carried by each of said arms and adapted to straddle the associated arm with the tine thereof being located in a pair of aligned slots on said opposed surfaces for maintaining the base member in one of said positions on the C-frame, and locking means for preventing the keeper member from slipping out of the accommodating slots during a dozing operation.

4,241,795
HAND POWERED HIGH IMPACT TOOL
Ernest A. Landry, Jr., 50 Bennett St., Lynn, Mass. 01905
Filed Jun. 5, 1978, Ser. No. 912,423
Int. Cl.[3] B25C *1/02*; B25D *9/04*
U.S. Cl. 173—90 **9 Claims**



1. A hand-powered tool for use with a conventional jackhammer tool bit to deliver high impact axial blows to said bit, said bit being of the type including a noncylindrical upper blow-receiving shank, a blow-transmitting working end, and an integral annular protrusion between said upper shank and said working end, said protrusion being spaced from the upper end of said bit by the axial length of said upper shank, said hand-powered tool comprising:
an impact rod,
said rod having a length of the order of two feet or greater and a diameter of the order of one inch or greater,
said rod being comprised of impact-resistant heavy material such as steel to have a weight of the order of ten pounds, and
said rod including a hand grippable upper end and a lower end shaped for impacting the upper end of said bit,
a tubular guide member, said member including
a bit guiding surface comprising a noncylindrical interior surface shaped to telescopically receive and thereby prevent rotation of said noncylindrical upper shank of said bit, said bit guiding surface extending upward from a lower end of said member by a length less than said length

of said bit shank, so that when said bit is installed in the lower end of said member, with said bit protrusion resting against said lower end of said member, the shank protrudes above said bit guiding surface,

a rod guiding surface comprising a cylindrical interior surface sized to telescopically receive said rod, said rod guiding surface extending downward from an upper end of said member and merging with said bit guiding surface and said rod guiding surface being shorter axially than said rod so that said hand grippable upper end protrudes from said guide member when said rod is installed and its lower end bears upon said bit, and

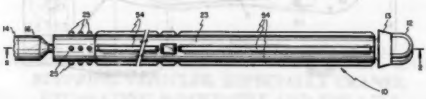
restraint means for retaining said bit within said guide member, said restraint means including an element suitable for connection to the lower end of said guide member and to said bit at a location below said protrusion.

4,241,796

ACTIVE DRILL STABILIZER ASSEMBLY

Sidney J. Green, Salt Lake City; Floyd H. Shipman, Holladay, and Carl J. H. B. Van Kempen, Salt Lake City, all of Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed Nov. 15, 1979, Ser. No. 94,586
Int. Cl.³ E21B *44/00*
U.S. Cl. 175—24 **31 Claims**



1. A drill stabilizer assembly comprising,

a body for arrangement within a well bore having a drill shaft journaled therethrough that connects to a drill bit;

means for connecting said drill shaft to a drill string;

sensor means arranged with said body to pass a fluid medium therethrough and direct it against the well bore wall sensing, as a differential pressure drop, when compared with another fluid pressure, an area of unequal spacing of said body from said well bore wall;

valve means arranged with said body and operated by said differential pressure drop to control a fluid medium flow passed therethrough;

a fluid medium source connected to pass said fluid medium flows to said sensor means and said valve means; and

means operated by said fluid medium flow from said valve means for applying a bending force associated with said body to provide a change in drilling direction.

4,241,797

IMPACT TOOL FOR DISLODGING STUCK DRILL BITS

John W. Allen, Jr., Lake Charles, La., assignor to James P. Creaghan, Lake Charles, La., a part interest

Filed Sep. 13, 1979, Ser. No. 75,114
Int. Cl.³ E21B *21/00*
U.S. Cl. 175—237 **6 Claims**

1. An improved impact tool for attachment in line in a drilling stem adjacently above a drill bit and comprising:

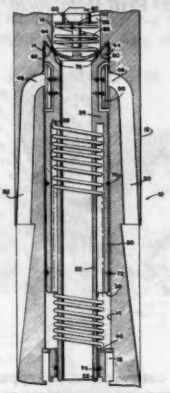
an impact tool casing having a cylindrically contoured hollow center for connecting a ground level end of the drill stem with a drill bit,

a steel ring means disposed at a lower section within said hollow center of said impact tool casing,

a set of concentrically disposed metal sleeves disposed within said hollow center of said impact tool casing being integrally coupled at an upper portion thereof, the outer sleeve having its lower end foreshortened respecting the lower end of the inner sleeve, the inner sleeve having an outer surface of its lower end essentially telescopically engaging with the inner surface of said steel ring means,

a helical spring disposed between said sleeves and providing sufficient tension to support said set of sleeves when said spring has its lower terminus engaging said steel ring means and its upper terminus engaging said at means where the sleeves are integrally coupled, and

an upper section of said outer sleeve closing off a jet con-



toured nozzle for directing mud flow downwardly peripherally of said impact tool casing.

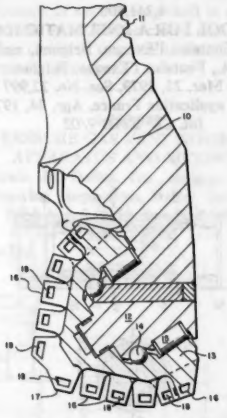
6. The invention of claim 1 wherein said plunger means is provided with a shaft and centering means for disposing said shaft centrally with said hollow center of the drill stem.

4,241,798

DRILLING BITS FOR PLASTIC FORMATIONS

Kenneth W. Jones, Kingwood, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Jan. 29, 1979, Ser. No. 7,066
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **2 Claims**



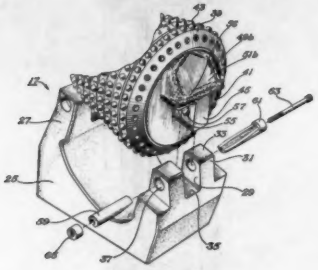
1. An oilwell drilling bit of the type having downwardly extending leg portions with inwardly extended bearing shafts and rotating rolling cutters on said bearing shafts, the improvement comprising large broad cutting teeth protruding from the surface of said rolling cutter, said cutting elements having extrusion openings formed therethrough in the direction of rotation of said cutting element on said bearing shaft.

4,241,799

PROTECTED CUTTER MOUNTING FOR DRILL BITS

Walter S. Going, III, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 17, 1979, Ser. No. 85,666
Int. Cl.[3] E21B *10/10, 10/20, 10/52*
U.S. Cl. 175—361 3 Claims



1. An improved cutter mounting apparatus for an earth boring drill bit, comprising in combination:

a cutter mount having spaced-apart inner and outer end;

a bearing carrier having inner and outer ends for mounting on the ends of the cutter mount;

a cutter shell rotatably mounted on the bearing carrier member;

a selected one of the cutter mount and bearing carrier having a slot through each of its end for receiving the end of the other in the slot;

the ends of the cutter mount and bearing carrier having transverse holes therethrough;

connection means for insertion through the holes to secure the cutter mount to the bearing carrier; and

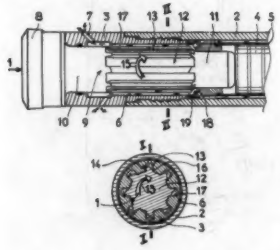
a protector member extending from at least one end of the bearing carrier and having a surface covering an opposing surface of the ends to protect them from formation damage.

4,241,800

CUTTING TOOL FOR A PNEUMATIC HAMMER

Pierre Stenuick, Fontaine l'Eveque, Belgium, assignor to Stenuick Freres S.A., Fontaine l'Eveque, Belgium

Filed Mar. 22, 1979, Ser. No. 22,997
Claims priority, application France, Apr. 24, 1978, 78 12012
Int. Cl.[3] E21B *9/02*
U.S. Cl. 175—400 5 Claims



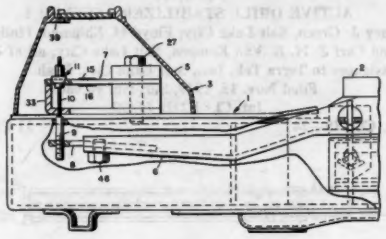
1. A cutting tool adapted to fit in the front cylinder of a pneumatic hammer operative at the bottom of a hole, comprising a head for supporting cutting bits, and a tail of reduced diameter extending from said head, said tail being provided with grooves forming alternating teeth adapted for engaging in symmetrical grooves provided in the interior of the front cylinder of the hammer, each said tooth being asymmetrical by virtue of having a working flank in contact with the front cylinder of the hammer during drilling which is of greater height than the other flank of the tooth, said asymmetrical tooth defining in a corresponding symmetrical groove in the interior of the front cylinder of the hammer an escape channel for compressed air from the hammer.

4,241,801

APPARATUS TO MEASURE ELONGATION DUE TO BENDING UNDER LOAD

Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.

Filed Aug. 3, 1978, Ser. No. 930,710
Int. Cl.[3] G01G *21/02*
U.S. Cl. 177—211 4 Claims



1. In an apparatus comprising strain gauges mounted on a cantilever load beam to measure elongation due to bending under load, the combination of, means for supporting said beam at one end, the other end being free, means adjacent the free end of said beam comprising a hole in said beam, a fitting having a semi-spherical portion mounted in said hole with its sides engaging the sides of said hole, a vertical bore in said fitting to the geometric center of curvature, a load cable in said bore connected to said fitting which exits at the geometric center of curvature of said semi-spherical portion of said fitting, and means connected to the other end of said cable for applying a load to said load beam whereby the strain is directly proportional to the effective length of the load beam.

4,241,802

METHOD AND CIRCUIT ARRANGEMENT FOR SWITCHING SIGNALS HAVING DIFFERENT TRANSMISSION SPEEDS WITHIN A PROGRAM-CONTROLLED DATA EXCHANGE SYSTEM

Ola Bergman, Starnberg-Landstetten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 22, 1979, Ser. No. 22,701
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813961
Int. Cl.[3] H04Q *9/00;* H04L *5/00, 11/00*
U.S. Cl. 178—3 9 Claims

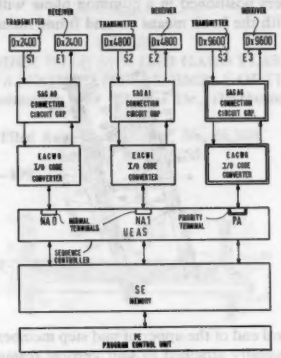
1. A method for switching signals which fall into different transmission speed class within a program-controlled data exchange system which has inputs and outputs assigned to respective speed classes, and a switching arrangement, comprising the steps of:

receiving the signals in respective transmission speed classes at respective inputs;

generating switching requests for each transmission class upon receipt of signals in the respective transmission class;

first, switching through to a respective output those signals which cause switching requests for the highest transmission speed class as a priority over the other transmission speed classes; and

then, only after completion of transmission at the highest transmission speed, switching through the signals of the



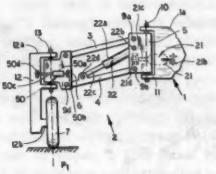
other speed classes alternately from respective inputs to respective outputs.

4,241,803

WHEEL-SUPPORT ASSEMBLY FOR ROLLING AND STEPPING VEHICLES, ESPECIALLY CRANES, EXCAVATING MACHINERY AND THE LIKE

Ernst Lauber, Thun, Switzerland, assignor to Willy Habegger, Thun, Switzerland

Filed Feb. 23, 1979, Ser. No. 14,594
Int. Cl.³ B62D *57/02*; B66C *23/62*
U.S. Cl. 180—8 R **6 Claims**



1. In a rolling and stepping vehicle having a machine support, at least one traveling leg comprising:

a crosshead pivotally mounted on said support for rotation about a vertical axis;

a first piston-and-cylinder arrangement connected between said support and said crosshead for angularly displacing said crosshead about said axis;

a pair of substantially parallel elongated link members pivotally connected to said crosshead at respective substantially horizontal axes and disposed one above the other in spaced apart relationship to define a parallelogrammatic linkage;

a pivot head pivotally connected to said link members at respective spaced apart substantially horizontal axes for swinging displacement by said parallelogrammatic linkage relative to said support;

a wheel assembly pivotally connected to said pivot head and defining therewith an axis about which a wheel of said assembly is pivotal relative to said pivot head; and

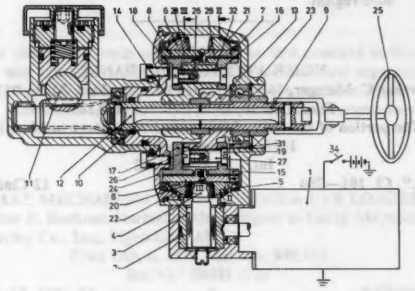
a second piston-and-cylinder arrangement lying generally diagonally with respect to said parallelogrammatic linkage and connected between one of said heads and one of said members at opposite ends of said linkage for swinging said linkage in a substantially vertical plane.

4,241,804

SERVO STEERING SYSTEM FOR MOTOR VEHICLES

Horst Deininger, and Werner Breitweg, both of Schwaebisch-Gmund, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,925
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2746919
Int. Cl.³ B62D *5/04*
U.S. Cl. 180—79.1 **11 Claims**



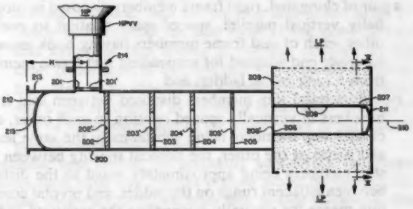
1. A servo steering system comprising a driving shaft (9), a hand steering wheel (25) connected to the driving shaft, a driven shaft (10), two friction clutches (15, 16-7 and 17, 18-14) releasably coupling the driving and driven shafts, an auxiliary driving source (1) and a gear unit (2, 5, 6) though which the friction clutches are driven by the source, said friction clutches including a pair of clutch drums (7, 8) driven in opposite directions through the gear unit, two pair of jaws (15, 16-17, 18) respectively engageable with said drums, a pair of clutch carriers (13, 14) connected to said driving and driven shafts, respectively, for rotation therewith, and means operatively connecting each of said jaws to both of said carriers for respectively causing engagement of one of the two friction clutches and disengagement of the other of the two friction clutches in response to rotation of said driving shaft in one direction and engagement of said other friction clutch and disengagement of said one friction clutch in response to rotation of said driving shaft in an opposite direction.

4,241,805

HIGH PRESSURE GAS VENT NOISE CONTROL APPARATUS AND METHOD

Calvin L. Chance, Jr., Dallas, Tex., assignor to Vibration and Noise Engineering Corporation, Dallas, Tex.

Filed Apr. 2, 1979, Ser. No. 26,189
Int. Cl.³ F01N *7/02, 1/24*
U.S. Cl. 181—232 **27 Claims**



1. High pressure gas vent noise control apparatus for controlling the noise emitted during venting of gas from a high pressure region to a low pressure region via a high pressure

vent valve at the high pressure region; said apparatus comprising:

a tubular member and a plurality of control orifices positioned longitudinally spaced from each other within said tubular member, said control orifices being configured and disposed such that vented gas passes therethrough with sonic velocity being attained at a respective throat of each of said orifices and the pressure downstream thereof is stepwise reduced relative to the pressure upstream thereof,

and flow control means downstream of said control orifices for controlling the discharge of said gas to said low pressure region.

4,241,806

NOISE ATTENUATION PANEL

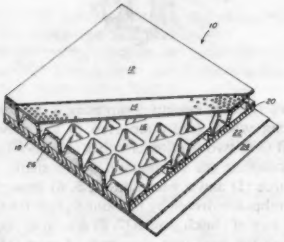
Arthur C. Metzger, 16 Forty Acres Dr., Wayland, Mass. 01778

Filed Oct. 10, 1978, Ser. No. 950,189

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—284 **12 Claims**



1. A laminated noise attenuation panel comprising:

an expanded core thermoplastic panel having alternately inverted cavities approximately one-half of which open to each side of said panel; and

a panel of a noise attenuation material secured to said expanded core panel comprising randomly dispersed hollow microspheres having an interior pressure of one-third atmospheres or less in a cured low-viscosity adhesive binder material having an elastic inter-molecular structure yielding elastic wave attenuating properties.

4,241,807

STEP ATTACHMENT FOR LADDERS

Phillip McKenna, Crowley, La., and Arthur Penarowski, Aurora, Colo., assignors to MacStep Co., Inc., Aurora, Colo.

Filed Nov. 17, 1978, Ser. No. 961,483

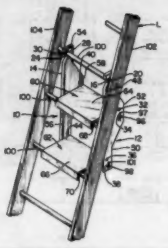
Int. Cl.³ E06C *5/32, 7/16*

U.S. Cl. 182—121 **4 Claims**

1. Step apparatus adapted for removable mounting on a ladder, comprising:

a pair of elongated, rigid frame members disposed in substantially vertical parallel, spaced-apart relation to one another, each of said frame members having hook means at its upper end adapted for suspending said frame members from a rung in the ladder; and

two horizontal step members disposed between said frame members in vertically spaced relation to each other, each of said step members being substantially the same length and width as the other, the vertical spacing between said step members being approximately equal to the distance between adjacent rungs on the ladder, and pivotal connection means for pivotally connecting the rearward ends of said step members to said vertical frame members, said pivotal connection means being vertically adjustable upwardly and downwardly with respect to said frame members, each of said steps having rung attachment means on the forward end thereof and being pivotally connected at their rearward ends to said vertical frame members with rung attachment means at the forward ends of said step members positioned in a common plane with each other and with the hook means on said frame members and the



rearward end of the upper of said step members positioned and pivotally attached to said vertical frame members a spaced distance rearwardly of a plane extending through said hook means and through the rearward end of the lower of said step members.

4,241,808

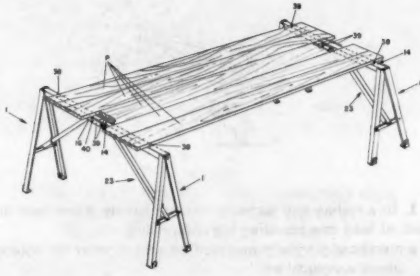
PORTABLE AND COLLAPSIBLE A-FRAME PROP TYPE SCAFFOLD

Donald E. Middleton, 4701 N. Napa, Spokane, Wash. 99207, and DeVere J. Audette, deceased, late of 1517 Nelson, Spokane, Wash. 99207 (by Marguerite Audette, executrix)

Filed Aug. 28, 1979, Ser. No. 70,358

Int. Cl.³ F16M *11/00*

U.S. Cl. 182—155 **7 Claims**



1. In a portable and collapsible A-frame scaffold including at least two A-frame leg units with horizontally disposed scaffold planks extending therebetween and being supported thereby, wherein each of said leg units is formed from L-shaped metal bars pivotally interconnected at their upper ends and diverging downwardly to form A-frame leg units, spanning bracing bars pivoted to said legs intermediate their ends and being removably interconnected, pivotally connected to the upper ends of each leg unit is a horizontally extending elongated plank supporting angle bar bracket, pivotally connected to the outer end of each of said brackets is a downwardly and angularly extending angle bar brace, a transverse angle bar formed on the lower end of each brace is engageable with said spanning leg bracing bars with the lower end of said brace projecting thereover, flat elongated strap means arranged on the underside of said brace at said lower end and being pivoted to the projected lower end of said brace so as to extend under said spanning leg bracing bars and said transverse angle bar, retaining ring means on said brace and engageable with said strap means for securing said

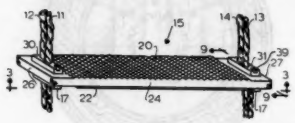
strap means against said brace and clamping and locking said leg bracing bars and transverse angle bar together and thereby preventing collapsing of each of said A-frame leg units.

4,241,809

ROPE LADDER WITH MOLDED HARD ELASTOMER STEPS AND A METHOD FOR ASSEMBLY OF THE SAME

Robert M. Salvarezza, 110 Braemar Dr., Hillsborough, Calif. 94010

Filed Aug. 13, 1979, Ser. No. 66,000
Int. Cl.³ E06C 1/56
U.S. Cl. 182—199 **12 Claims**



1. A rope ladder of the type having a series of ladder steps, each with an upper surface and a lower surface, two longitudinal edges and two end edges, and two spaced-apart pairs of ropes, the improvement wherein:

each said step is a molded one-piece hard elastomer member having two spaced-apart vertical through openings, one spaced in from each said edge, each said through opening being narrow at its upper end for closely confining said ropes and being much wider than that where it emerges from said lower surface, each through opening tapering inwardly from bottom to top, each said step having vertical bolt openings therethrough adjacent each said through opening,

a pair of separate wedge collars for each said step, one at each end of and below said step and bearing up against it, each said wedge collar having a single elongated through opening whose upper end is approximately the same width as said step's through opening where it emerges from its lower surface, said elongated through opening tapering inwardly therefrom down to a narrow portion at the lower end for closely confining the two ropes, each said wedge collar having vertical bolt passages therethrough aligned with the bolt openings through said step,

a generally diamond-shaped wedge heart in between the said ropes of each pair of ropes, a said heart lying in each through opening of each step and extending into each said elongated through opening of said wedge collar, said wedge heart having an upper vertex adjacent said upper end of said step's through opening and a lower vertex adjacent the bottom of the elongated through opening of said wedge collar, and providing two rope-engaging side grooves extending between and ending at said vertices, so that these rope-engaging grooves, when said wedge heart is fully wedged in place, lock the pair of ropes in place and prevent relative movement between them and said step, said wedge collar and said wedge heart, and

fastening means extending through the bolt passages of each wedge collar and the bolt openings of each step and tightened in place to hold said wedge collar and wedge heart in place and lock said ropes in fixed position relative to said wedge heart, said step, and said wedge collar.

4,241,810

DEVICE FOR ABSORBING MECHANICAL SHOCK

Charles E. Newlon, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1979, Ser. No. 70,546
Int. Cl.³ F16D 63/00
U.S. Cl. 188—1 C **11 Claims**

1. A device for absorbing mechanical shock, comprising:

a wooden member comprising a basal portion and an opposed top portion, the basal portion being formed of solid cross-section, and the top portion being formed of spaced-apart segments formed between openings in the top portion whose upper faces cooperatively define a concave surface, and

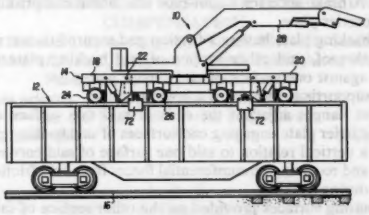
an elastomeric strip superimposed on said concave surface and extrudable into the openings between said segments when forced against the segments by a pressure above a preselected value to effect deformation of said segments to a point capable of breakage thereof.

4,241,811

BRAKE MECHANISM FOR A GONDOLA CAR LOADER

Walter E. Buckner, Hartselle, Ala., assignor to Lucky Manufacturing Co., Inc., Huntsville, Ala.

Filed Oct. 6, 1978, Ser. No. 949,116
Int. Cl.³ B61H 7/12
U.S. Cl. 188—43 **6 Claims**



1. A brake mechanism for a vehicle moveable along the top of adjacent gondola cars, the vehicle having a chassis moveably supportable by wheels on the upper edges of side walls of the gondola cars, comprising:

a brake shoe rack including:

a first pair of brake shoes, selectively moveable in opposition to one another to clamp a first side wall of a gondola car, said first pair of brake shoes including an inner brake shoe for engaging the inside of the first side wall and an outer brake shoe for engaging the outside of the first side wall;

a second pair of brake shoes, selectively moveable in opposition to one another to clamp a second side wall of the gondola car, including an inner brake shoe for engaging the inside of the second side wall and an outer brake shoe for engaging the outer side wall; and

a braking hydraulic ram for moving said brake shoes to clamp and unclamp the side walls of the gondola car, said hydraulic ram having a cylinder coupled to the inner brake shoe of the first pair of brake shoes and to the outer brake shoe of the second pair of brake shoes; and a piston coupled to the outer brake shoe of the first pair of brake shoes and to the inner brake of the second pair of brake shoes; and

hydraulic ram means for pivotably supporting the brake shoe rack from the vehicle chassis while permitting the brake shoe rack to move from side to side relative to the chassis, whereby the brake shoe rack is moveable from side to side relative to the chassis to enable the brake mechanism to accommodate gondola car side walls which are bowed or otherwise irregularly shaped,

said hydraulic ram means also being operative for raising

and lowering the brake shoe rack relative to the chassis, whereby the brake shoe rack is raiseable and lowerable to clear end walls of the gondola car as the vehicle is moved across gaps between adjacent gondola cars.

4,241,812

BRAKE SHOE FOR A SPOT-TYPE DISC BRAKE

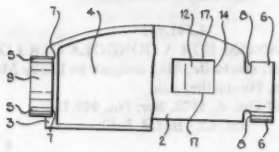
Jochen Burgdorf, Offenbach; Hans-Henning Lüpertz, Darmstadt, and Helmut Kast, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 965,957

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2755325

Int. Cl.³ F16D *65/04*

U.S. Cl. 188—73.1 **10 Claims**



1. A brake shoe for a spot-type disc brake comprising:

a carrier plate;

a backing plate having a friction pad secured to one surface thereof, said other surface of said backing plate resting against one surface of said carrier plate;

a supporting member of a brake housing;

first flanges adjacent the ends of said one surface of said carrier plate engaging end surfaces of said backing plate in a vertical relation to said one surface of said carrier plate and receiving circumferential forces from said friction pad during braking;

abutting surfaces provided on the other surface of said carrier plate extending from adjacent the ends of said carrier plate inward to a point adjacent said vertical end surface of said backing plate, said abutting surfaces abutting against said supporting member; and

second flanges formed in said other surface of said carrier plate, end faces of said second flanges in a vertical relation to said other surface of said carrier plate engaging said supporting member to transmit said circumferential forces to said supporting member.

4,241,813

BAND BRAKE PARKING LEVER

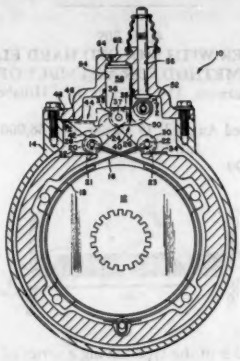
Norman C. Van De Sompele, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 29, 1979, Ser. No. 53,602

Int. Cl.³ F16D *49/08, 49/10, 49/12*

U.S. Cl. 188—77 R **3 Claims**

1. In a band brake assembly having a housing, a rotatable member carried by said housing, a band disposed within said housing and carrying a friction lining substantially surrounding said rotatable member, a pair of unitary links having a common pivotal connection therebetween, each link being connected with a respective end of said band, a hydraulic service brake actuator cooperating with said pair of links to contract said friction lining into engagement with said rotatable member to retard the rotation of said rotatable member, a parking brake actuator, and a unitary parking brake lever connected to said parking brake actuator, said parking brake lever including a first end pivotally engaging said housing and a second end remote from said first end connecting with said parking brake actuator and engaging said common pivotal connection and cooperating with said pair of links to contract said friction lining into engagement with said rotatable member upon a parking brake application, characterized by said unitary parking brake lever being engageable with said housing, the engagement of said lever with said housing defining a fulcrum about which said lever pivots in response to operation of said parking brake actuator.



4,241,814

MECHANICAL-HYDRAULIC DAMPER FOR A LOAD SUBJECT TO SHOCKS AND VIBRATIONS

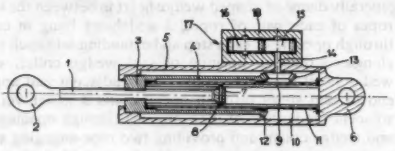
Jean Masclet, Paris, France, assignor to Messier-Hispano-Bugatti, Montrouge, France

Filed Mar. 14, 1978, Ser. No. 886,347

Claims priority, application France, Mar. 16, 1977, 77 07826; Apr. 27, 1977, 77 12850

Int. Cl.² F16D *57/06*

U.S. Cl. 188—266 **8 Claims**



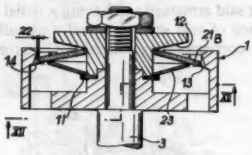
1. A mechanical-hydraulic damper for a load which is subject to shocks and vibrations, comprising a co-operating pair of elements including a ball or roller screw and a nut, a first element of said pair of elements being mounted in a body for relative axial movement in relation to said body and the second element of said pair of elements being rotatably mounted in said body and so coupled to said first element that relative axial movement of said first element causes rotation of said second element, with said second element being coupled to hydraulic means which resist sudden or rapid rotation of said second element including drive means comprising a reversible pump to cause flow of hydraulic fluid around a closed hydraulic circuit mounted on said body, the rate of flow of fluid being restricted by a calibrated orifice comprising a reversible symmetrical control valve in communication with a reservoir of hydraulic fluid, the outlet of which is coupled to a fluid inlet at the middle of said symmetrical control valve, whereby the mechanical-hydraulic damper functions to damp successive shocks and vibrations in the same or reverse directions.

4,241,815

VARIABLE-THROTTLE VALVE

Jean Federspiel, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 974,608, Dec. 29, 1978, abandoned, which is a continuation of Ser. No. 728,120, Sep. 30, 1976, abandoned.
This application Jan. 9, 1980, Ser. No. 110,598
Claims priority, application France, Oct. 9, 1975, 75 30944
Int. Cl.[3] F16F 9/34
U.S. Cl. 188—282 4 Claims



1. A variable-throttle valve comprising:

a valve body of revolution and a rod, the valve body being rigidly fixed to said rod, said rod extending along the revolution axis of said valve body, said body being provided with a peripheral wall surrounding said rod and defining a passageway for a fluid therebetween, said body and said fluid being movable relative to each other to generate a flow of fluid in a first direction or in a second direction through said passageway according to the direction of relative movement between said body and said fluid, said passageway being of revolution with respect to said axis of said valve body;

an annular zone providing a projection on said peripheral wall of said valve body, said projection being directed radially towards the axial rod;

a first stop and a second stop carried by said rod in said passageway; and

a conical washer which is mounted generally transversely relative to said passageway and is pierced by a central opening through which said rod extends, said washer having a central edge capable of cooperating with each of said stops and a peripheral edge defining a variable cross-sectional area opening with said annular projection;

said stops being axially spaced apart a distance greater than the axial thickness of said washer;

said washer being capable of free displacement with respect to said body under the action of said flow of fluid through said passageway along said axis of said valve body between a free-flow end position in which said central edge of the washer engages said first stop when said flow of fluid is in said first direction and a throttling end position in which said central edge of the washer engages said second stop when said flow of fluid is in said second direction;

said washer being capable of elastic deformation, the deflection and the thickness in a condition of rest of said washer being in a ratio which is higher than 1.4, whereby temporary and elastic reversal of conicity of said washer is possible, said conical washer being oriented in such a manner that said washer is always in said condition of rest when said washer is in said free-flow position, whatever the fluid pressure at said passageway in said first direction of said flow or fluid, whereas when said washer is in said throttling end position, said washer is in said condition of rest when the fluid pressure at said passageway in said second direction of said flow of fluid is below a predetermined threshold value, the conicity of said washer being reversed when said fluid pressure at said passageway in said second direction of said flow of fluid is above said predetermined threshold value;

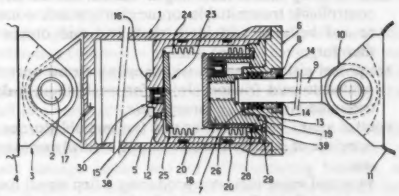
the variable cross-sectional area opening defined between said peripheral edge of said washer and said annular projection having a first value which permits the free flow of fluid through said passageway in said first direction when said washer is at said free-flow end position, said variable cross-sectional area opening having a second value achieved solely by radial clearance between said peripheral edge and said annular projection which constricts the flow of fluid through said passageway to a greatest degree when said washer is at said throttling end position and when said fluid pressure at said passageway in said second direction of said flow of fluid is below said predetermined threshold value, whereby said washer is in said condition of rest, and said variable cross-sectional area opening having a third value which constricts the flow of fluid through said passageway to a degree smaller than said greatest degree when said washer is at said throttling end position and when said fluid pressure at said passageway in said second direction of said flow of fluid is above said predetermined threshold value, whereby the conicity of said washer is reversed.

4,241,816

SELF-LOCKING SHOCK ABSORBER WITH VOLUME COMPENSATION

Gerard Hubrecht, Strasbourg, and Gerard Mechain, Schiltigheim, both of France, assignors to Quiri, Schiltigheim, France

Filed Nov. 1, 1978, Ser. No. 956,747
Claims priority, application France, Nov. 10, 1977, 77 34956
Int. Cl.[3] F16F 9/06, 9/50; F16L 55/04
U.S. Cl. 188—298 9 Claims



1. A self-locking shock absorber assembly for preventing damage to pipeline members and the like exposed to sudden movements by temporarily immobilizing such members relative to their rigid supports comprising a hydraulic cylinder defining a sealed hydraulic chamber, a piston-head mounted within said chamber for reciprocal movement therealong, a piston rod extending outwardly from said cylinder and operatively connected to the piston head for reciprocal movement therewith, said cylinder and said rod having means for connection to said members and said supports, said piston head being provided with an interior compensating chamber for forming a fluid communication between portions of the hydraulic chamber at opposite ends of said piston head, a deformable fluid-tight capsule positioned within said compensating chamber and together with said piston head defining the course of said fluid communication, and valve means carried by said piston head to control fluid flow between said hydraulic chamber portions and said compensating chamber, said valve means being adapted to automatically close in response to rapid fluid flow therethrough corresponding to a preselected sudden movement thereby automatically locking said piston head and rod against further movement within said piston chamber.

4,241,817

DRIVE MECHANISM FOR MACHINES, HAVING IN PARTICULAR A GREAT MOMENT OF INERTIA

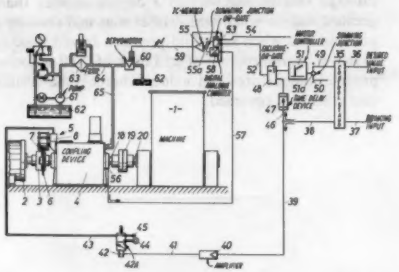
Wolfgang Leiber, Oberweikertshofen, and Hans J. Ruesch, Munich, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 921,087

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2729935

Int. Cl.³ F16D *67/02*

U.S. Cl. 192—12 C **7 Claims**



1. A drive mechanism for a machine having an input shaft, said machine having in particular a great moment of inertia, comprising:

a drive motor having an output shaft;

coupling means having an input shaft and an output shaft, said output shaft of said coupling means being connected to said input shaft of said machine;

brake means connected between said output shaft of said motor and said input shaft of said coupling means and means for activating same;

said coupling means including a friction clutch having a controllable transmittable torque characteristic connected to and between said input shaft and said output shaft therefor;

reciprocal piston means in said coupling means operatively related to said friction clutch for establishing a desired transmittable torque characteristic;

control means for controlling said transmittable torque characteristic of said friction clutch, said control means including:

an actual value indicator producing a first signal for indicating the driven speed of said output shaft of said coupling means;

a master controller producing a second signal for indicating the desired speed of said output shaft of said coupling means; and

a controller responsive to said actual value indicator and said reference element for controlling the force and direction of said force on said reciprocal piston to thereby control the speed of said output shaft of said coupling means.

4,241,818

LIGHTWEIGHT ELECTROMAGNETIC CLUTCH WITH SHOCK ABSORBER

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Oct. 30, 1978, Ser. No. 956,134

Int. Cl.² F16D *27/10*

U.S. Cl. 192—55 **8 Claims**

1. An electromagnetic clucth for establishing drive between first and second clutch members comprising:

a ferromagnetic inner body having a radial face portion drivingly connected to one of said members;

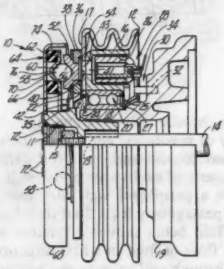
a ferromagnetic armature drivingly connected to the other of said members positioned adjacent said inner body and having a radial face opposite said inner body radial face;

means mounting said armature and inner body enabling relative axial movement to bring said radial faces into and out of driving engagement;

return spring means urging said inner body and armature out of driving engagement;

electromagnetic coil means positioned to cause said inner body and armature to be drawn into driving engagement upon energization;

torque booster means including a ball plate element disposed adjacent said armature and having a radial face opposite a radial face of said armature, and a plurality of balls disposed in corresponding conical pockets formed in each of



said radial faces of said ball plate element and said armature whereby torque is transmitted through said balls between said armature and said clutch element, and the driving engagement force between said armature and inner body radial face portion is thereby increased by the action of said balls;

a coupling plate axially spaced from said ball plate element and connected to said other member;

shock absorber means joined to said coupling plate and ball plate element and at least partially filling the axial space therebetween;

whereby said shock absorber means accommodates relative angular and axial movement between said first and second clutch elements, to reduce axial shock forces generated by said torque booster means.

4,241,819

CLUTCH PRESSURE PLATE NOISE REDUCTION

Bryce W. Babcock, Saline; Mark P. Reynolds, Birmingham, and Kulbir Saluja, Southfield, all of Mich., assignors to Federal-Mogul Corporation, Detroit, Mich.

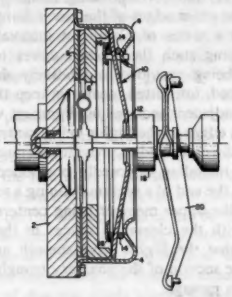
Division of Ser. No. 710,508, Aug. 2, 1976, Pat. No. 4,126,216. This application Oct. 5, 1978, Ser. No. 948,931

Int. Cl.³ F16D *13/50*

U.S. Cl. 192—70.27 **5 Claims**

1. A clutch assembly including a flywheel, a pressure plate normally engaged to rotate with the flywheel and axially disengageable in relation therewith, a friction disc interposed between the flywheel and the pressure plate, and a clutch spring operatively associated with the pressure plate whereby upon exertion of an actuation force to the clutch spring, the pressure plate will cause the interposing friction disc to be disengaged from the flywheel, wherein said clutch spring is of a generally frustoconical shaped disc having a centrally located bore adapted to surround a shaft upon which is fixed said friction disc, said clutch spring being of spring steel and slotted beginning at the periphery of said bore and extending radially outwardly to a point intermediate the periphery of said bore and the outer periphery of said frustoconical shaped disc so as to form therebetween a plurality of inwardly extending integral clutch spring fingers, each said clutch spring finger having

a free end toward the axis of rotation of said pressure plate and a surface at said free end adapted to receive the actuation force, said assembly including means for modifying the natural frequencies of a majority of said clutch spring fingers to reduce resonant vibrations within the audible frequency range during



actuation of the clutch whereby audible resonant vibrations caused in said clutch spring fingers as a result of the free end of each such clutch spring finger coming into initial contact with and being in rotation with a clutch throw-out bearing, will be at least substantially eliminated.

4,241,820

CLUTCH ASSEMBLY

Hiroshi Ban, Toyota; Tadamasa Kobayashi, Okazaki, and Syozo Kuno, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1978, Ser. No. 946,918

Claims priority, application Japan, Oct. 6, 1977, 52-134559

Int. Cl.³ F16D *13/71*

U.S. Cl. 192—89 B **4 Claims**

1. A clutch assembly comprising a flywheel secured to a drive shaft, a clutch cover secured to said flywheel, a diaphragm spring including an annular spring portion and a plurality of release fingers separated by slots having enlarged openings positioned at the outer ends of said slots, said diaphragm spring being pivotally mounted on the outer surface of said clutch cover by mounting means including a plurality of pivot rivets extending through said openings, an annular pressure plate disposed inside said clutch cover, a plurality of flexible drive straps interposed between said pressure plate and said clutch cover and extending chordally across said pressure plate, first securing rivet means securing one end of each drive strap to said pressure plate, second securing rivet means securing the other end of each drive strap to said clutch cover and positioned radially inwardly of the inner periphery of said pressure plate in alignment with said openings, and a driven disc interposed between said flywheel and said pressure plate and slidably splined on a driven shaft.

4,241,821

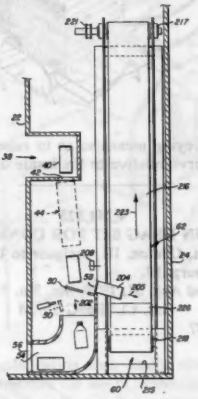
CONTAINER RETURN APPARATUS

Samuel C. Wu, Lakewood; Stephen A. Holick, and Robert A. Bottelsen, both of Littleton, all of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Feb. 9, 1979, Ser. No. 10,881

Int. Cl.³ G07F *7/06*

U.S. Cl. 194—4 C **34 Claims**



1. Apparatus for receiving used metallic containers, separating used metallic containers and other articles into acceptable containers and other unacceptable articles and for dispensing a token or the like for the value of acceptable used containers received and comprising:

a free fall passage means defining a vertically downwardly extending continuous annular passage having an inlet end for receiving the containers and an outlet end for discharging the containers, said passage means enabling free fall of a vertically oriented container therethrough;

sensor means associated with said free fall passage means for determining the presence of an acceptable container in said passage means and for differentiating between an acceptable container and other unacceptable articles during free fall of the containers and articles through said passage means;

separator means responsive to control by said sensor means during free fall of containers through said passage means for separating an acceptable container from other unacceptable articles after discharge from the outlet end of said free fall passage means; and

dispensing means operative in response to the presence and separation of an acceptable container for dispensing a token or the like for the value of the acceptable container.

4,241,822

APPARATUS FOR CONVEYING ROD-LIKE ARTICLES

Desmond W. Molins; Peter A. Clarke, both of London, and Eric A. Luddington, Ringwood, all of England, assignors to Molins Limited, England

Filed Nov. 8, 1978, Ser. No. 958,720

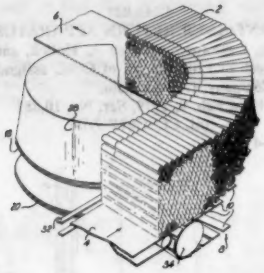
Claims priority, application United Kingdom, Nov. 22, 1977, 48679/77

Int. Cl.³ B65G *15/02, 15/62, 47/24, 47/68*

U.S. Cl. 198—406 **44 Claims**

1. Apparatus for conveying rod-like articles comprising means for moving a stream consisting of a stack of rod-like articles in a direction transverse to their lengths, means for

conveying the stack around a curved path about an axis generally perpendicular to said direction, and guide means for elevating said conveying means so as to raise the stack on the outside of the curve relative to the inside of the curve.

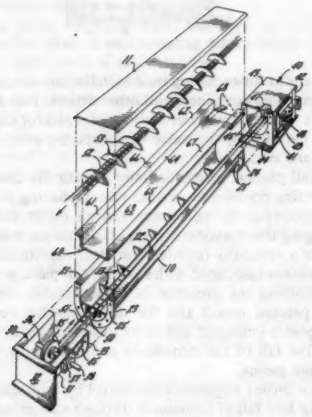


4,241,823

CHAIN DRAG KIT FOR CONVEYOR

Merle E. Clewett, Clinton, Ill., assignor to Union Iron Works, Inc., Warrensburg, Ill.

Filed Aug. 31, 1979, Ser. No. 71,678
Int. Cl.[3] B65G *19/28*
U.S. Cl. 198—727 **1 Claim**



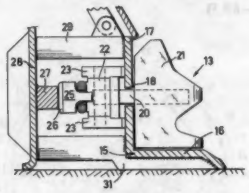
1. A drag chain conveyor kit for converting a screw conveyor to a drag chain conveyor, the screw conveyor being of the type having a main trough having a semi-circular bottom with parallel flanges extending horizontally outwardly along its upper edges and end flanges extending outwardly along its end edges together with a removable matching substantially flat cover having side edges dimensioned to rest on the parallel flanges, the combination comprising a pair of sprocket boxes dimensioned for assembly on the respective end flanges of the main trough and having mutually aligned sprockets journaled therein including a drive sprocket, an endless drag chain trained about the sprockets to form lower and upper runs of chain, conveyor flights secured to the chain at spaced intervals and extending at right angles thereto, the flights each having a semi-circular edge conforming to the semi-circular bottom of the main trough and having a straight edge, a relatively shallow auxiliary trough of rectangularly U-shaped cross section having parallel flanges extending horizontally outwardly along its respective upper edges and having a width dimension such as to provide a nested fit of the auxiliary trough into the main trough with the horizontal flanges on the auxiliary trough supported on the corresponding flanges of the main trough, the auxiliary trough having a flat bottom forming a return guide surface for the straight edges of the flights on the upper run of chain, the flanges on the auxiliary trough being of such width that when the cover is applied (1) the horizontal flanges on the auxiliary trough, (2) the corresponding flanges on the main trough, and (3) the outer edges of the cover form a sandwich construction, and a series of clamps at intervals along the flanges for clamping such flanges and cover together, the auxiliary trough being provided in relatively short sections arranged end to end, interfitted means to keep the presented end edges of the adjacent sections in alignment with one another, the straight edges of the flights being centrally notched to accommodate the chain and to provide clearance space, the interfitted means including opposedly positioned upper and lower members at the end of a section defining a socket for the adjacent section, the upper member being centered in a position registered with the clearance spaces in the successive flights to insure that the flights have smooth uninterrupted guidance from one section of the auxiliary trough to the next during their return passage.

4,241,824

CONVEYORS FOR USE IN MINERAL MINING INSTALLATIONS

Werner Georg; Gerhard Merten, both of Lunen, and Helmut Langenberg, Waltrop, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Fed. Rep. of Germany

Continuation of Ser. No. 841,767, Oct. 13, 1977, abandoned, Continuation of Ser. No. 696,658, Jun. 16, 1976, abandoned. This application Nov. 3, 1978, Ser. No. 957,501
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1975, 2527044; Dec. 27, 1975, 2558884
Int. Cl.[3] B65G *25/00*
U.S. Cl. 198—745 **8 Claims**



3. In a shuttle conveyor for use in underground mineral mining installations and comprising:

a series of pans arranged end-to-end, each pan having a floor plate along which material is conveyed and a side wall generally upstanding relative to the floor plate, the pans defining a conveying zone disposed above the floor plates with the side wall of each pan having a first side facing the conveying zone and a second side opposite therefrom, longitudinally spaced supports connected at least to said side walls and said floor plates and defining an open, rigid stable framework and forming a driving zone disposed externally of the conveying zone, whereby any fine mineral mining material entering the driving zone may fall freely onto the floor of the working to prevent jamming of a drive system within said driving zone, the second sides of the side walls of the pans facing said driving zone, slot means extending longitudinally of the conveying zone and providing direct communication between the driving and conveying zones, a plurality of material entrainment devices for conveying material along the conveying zone and over the floor plates of the pans, each of said devices having a first part located in the conveying zone and a second part located in the driving zone, each of said de-

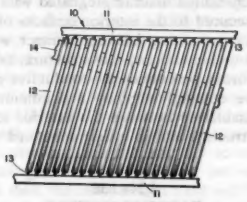
vices extending through said slot means, drive means including elongate traction means located in the driving zone for driving the devices in unison back and forth in reciprocal manner in first and second directions, whereby said devices convey material along the conveying zone in said first direction and return predominantly without conveying material in said second direction, pivotal mounting means mounting the second parts of the devices to the traction means to permit said devices to pivot automatically between a working position wherein the first parts of the devices extend generally laterally outwards from the first sides of the side walls of the pans and over the floor plates of the pans when the drive means moves the devices in the first direction and an inoperative position wherein the first parts of the devices are stowed adjacent the first sides of the side walls of the pans when the drive means moves the devices in the second direction; stop means on the second parts of the devices for maintaining the devices in the working position when the drive means moves the devices in the first direction; the improvement comprising the traction means composed of a plurality of elongate guide blocks spaced apart longitudinally of the conveying zone and interconnected by means of closed chain links permitting relative articulation, the pivot mounting means serving to pivotably mount each of the entrainment devices to a respective one of the guide blocks, and guide means in the driving zone for slidably engaging solely with the guide blocks to guide the traction means during its reciprocal movement.

4,241,825

PIVOTED GIMBEL BEARING FOR ROLLERS

Gerald A. Brouwer, Grandville, Mich., assignor to Lear Siegler, Inc., Rapistan Division, Grand Rapids, Mich.

Filed Apr. 30, 1979, Ser. No. 34,947
Int. Cl.³ B65G *13/12*
U.S. Cl. 198—782 **8 Claims**



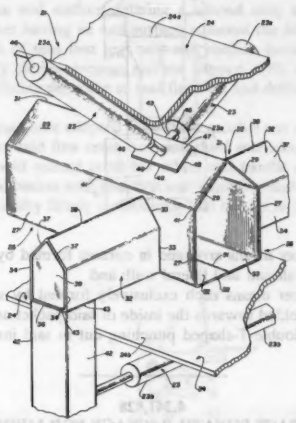
1. In a conveyor having a pair of side frame members and rollers mounted therebetween, the axes of said rollers being skewed with respect to said frame members, a support shaft projecting from each end of each of said rollers, the improvement in said conveyor comprising: a bearing member at each end of each of said rollers, each of said bearing members having parallel planar upper and lower surfaces each of said bearing members having a generally horizontal opening therein receiving one of said support shafts; a generally horizontal flange on each of said frame members; the lower surfaces of said bearing members being seated on said flanges; a cap member secured to each of said frame members, each cap member having a generally horizontal leg seated over and engaging the upper surfaces of said bearing members; pivot means substantially centered with respect to each of said bearing members securing said bearing members to both said flange and said leg for rotation about a vertical axis whereby said bearing members may be rotated in a horizontal plane to adjust to the angular relationship between said frame members and the shaft of said rollers.

4,241,826

CONVEYOR ASSEMBLY SUPPORT STRUCTURE AND HIGH STRENGTH TUBULAR BEAM THEREFOR

Charles J. Billington, P.O. Box 4204, Modesto, Calif. 95352

Filed Jul. 18, 1978, Ser. No. 925,706
Int. Cl.³ B65G *39/10*
U.S. Cl. 198—825 **7 Claims**



1. A high strength, debris free, easily cleaned conveyor assembly support structure for use in supporting a plurality of roller elements and an endless belt mounted for movement over said roller elements, said support structure formed for support of and having said roller elements mounted thereto, wherein the improvement in said conveyor assembly support structure is comprised of:

said support structure including a longitudinally extending beam positioned substantially along the length of and subjacent an upper portion of said belt;

said beam being formed as a tubular member having a pair of vertical side walls, a bottom wall means connecting said side walls, and a pair of upwardly sloped top walls extending from said side walls and meeting in a common apex;

said support structure further including a plurality of cross-beam members having sloped top walls and secured to said vertical side walls of said longitudinally extending beam in a manner to not extend above said vertical side walls, and extending from both sides thereof;

said sloped top walls of said longitudinally extending beam being formed for support of said roller elements; and

said longitudinally extending beam and said cross-beam members being free of upwardly facing horizontally oriented surfaces.

4,241,827

PACKET HAVING SPACER MEMBERS

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Continuation of Ser. No. 917,237, Jun. 20, 1978, abandoned.
This application Oct. 11, 1979, Ser. No. 83,705
Int. Cl.³ B65D *85/10, 5/50;* A24F *15/00*
U.S. Cl. 206—248 **5 Claims**

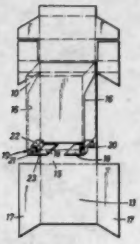
1. A packet for block-shaped articles, particularly cigarette groups or the like, said articles wrapped in an inner folded blank made of stiff paper, cardboard or other foldable material, having front, rear, bottom and side lateral walls to define a packet, the improvement comprising:

said lateral walls of said packet each comprise two lateral flaps folded on top of each other;

a folded-over corner flap connected with an inner one of

said lateral flaps and located at the inner side of said bottom wall;

said block-shaped article supported away from said bottom wall by spacer means arranged in the area of said bottom wall;



said spacer means arranged in corners formed by said bottom wall and said lateral wall; and

said spacer means each exclusively formed by supporting flaps folded towards the inside of said packet and formed by a double-T-shaped punching cut in said inner lateral flap.

4,241,828

COMPACT SHEATH PACKAGE FOR MEDICAL INSTRUMENTS

Peter A. Bourdelle, Plainsboro, and Norman Schiff, Kendall Park, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 30, 1976, Ser. No. 710,044

Int. Cl.³ B65D *85/38*

U.S. Cl. 206—306 **3 Claims**

1. A sheath package comprising: an elongatable prophylactic sheath having an open end for receiving an instrument and a closed end for covering at least a portion of said instrument; an envelope including two substantially parallel members joined together at the edges thereof, said envelope having an entry end and an exit end having a length in the longitudinal direction less than the length of said sheath when elongated, said sheath being affixed to the interior surface of said envelope with said open end facing said entry end, said sheath being compacted in length to be completely accommodated within said envelope; means to seal said envelope to protect the cleanliness of the outside surface of said sheath therewithin before use, said entry end of said envelope being capable of being penetrated by an instrument for insertion into said open end of said sheath, and said exit end of said envelope being capable of being penetrated by the sheath-covered instrument; and guide means located in said open end of said sheath for assisting in directing said instrument into said sheath, said guide means including a tapered tongue element which is inserted in said open end of said sheath, a portion of said guide means being affixed to the interior surface of at least one of said parallel envelope members.

4,241,829

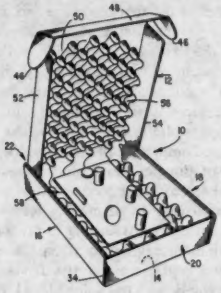
MEANS FOR CONTAINING ELECTROSTATIC SENSITIVE ELECTRONIC COMPONENTS

Charles T. Hardy, Alsip, Ill., assignor to Republic Packaging Company, Chicago, Ill.

Filed Jun. 4, 1979, Ser. No. 44,846

Int. Cl.³ B65D *81/00, 81/04, 75/30, 65/42*

U.S. Cl. 206—328 **2 Claims**



1. A container for use with electrostatic sensitive electronic components comprising:

a box-like structure having a bottom, a pair of opposed side walls, a pair of opposed end walls and a top movable between a first position exposing the interior of said box-like structure and a second position enclosing said box-like structure;

a continuous conductive coating formed overlying substantially all of the exterior and interior surfaces of said box-like structure; and

a liner of convoluted foam impregnated with a conductive material secured to the interior surfaces of said top and bottom for promoting intimate contact with an article contained within said box-like structure, said conductive material forming a continuous conductive path with said conductive coating, whereby a continuous conductive path is established between the exterior surface of said box-like structure and an article contained therein.

4,241,830

PACKING SYSTEM

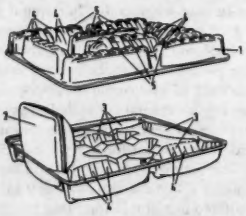
Giovanni Di Gesu', Palermo, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Filed Feb. 12, 1979, Ser. No. 11,151

Claims priority, application Italy, Feb. 20, 1978, 67342 A/78

Int. Cl.³ B65D *71/00*

U.S. Cl. 206—422 **23 Claims**



1. A packing device for storing and transporting a plurality

of items, comprising a pair of unconnected substantially identical shells, each of said shells being elongated and including a plurality of preformed elongated recesses provided in one surface thereof for defining corresponding projections on an opposite surface thereof, said recesses of each of said shells being sized, shaped, and located such that each of said recesses of a first shell of said pair of shells cooperates with a corresponding one of said recesses of a second shell of said pair of shells to firmly retain an item between said first and second shells when said first and second shells are spaced apart and mutually inverted so that said recesses in said first shell open toward said recesses in said second shell, first and second recesses of said plurality of recesses of said first shell extending along a first longitudinal edge of said first shell in end-to-end fashion, third and fourth recesses of said plurality of recesses of said first shell extending along a second longitudinal edge of said first shell in end-to-end fashion, a fifth recess of said plurality of said recesses of said first shell extending along a first lateral edge of said first shell, a sixth recess of said plurality of recesses of said first shell extending along a second lateral edge of said first shell, and a seventh recess of said plurality of recesses of said first shell extending along a longitudinal axis of said first shell between said first, second, third and fourth recesses of said first shell, said seventh recess of said first shell being sized and arranged such that a first plane extending generally laterally across said first shell passes through one of said first and second recesses of said first shell, one of said third and fourth recesses of said first shell, and said seventh recess of said first shell and such that a second plane extending generally laterally across said first shell passes through the other of said first and second recesses of said first shell, the other of said third and fourth recesses of said first shell, and said seventh recess of said first shell, and first and second recesses of said plurality of recesses of said second shell extending along a first longitudinal edge of said second shell in end-to-end fashion, third and fourth recesses of said plurality of recesses of said second shell extending along a second longitudinal edge of said second shell in end-to-end fashion, a fifth recess of said plurality of recesses of said second shell extending along a first lateral edge of said second shell, a sixth recess of said plurality of recesses of said second shell extending along a second lateral edge of said second shell, and a seventh recess of said plurality of recesses of said second shell extending along a longitudinal axis of said second shell between said first, second, third, and fourth recesses of said second shell, said seventh recess of said second shell being sized and arranged such that a third plane extending generally laterally across said second shell passes through one of said first and second recesses of said second shell, one of said third and fourth recesses of said second shell, and said seventh recess of said second shell and such that a fourth plane extending generally laterally across said second shell passes through the other of said first and second recesses of said second shell, the other of said third and fourth recesses of said second shell, and said seventh recess of said second shell.

4,241,831

HANDLE PARTICULARLY FOR WIRE BASKETS

Gianbattista Locatelli, Via Trieste, 12, Lecco (Province of Como), Italy

Filed May 30, 1978, Ser. No. 910,791
Claims priority, application Italy, Jun. 3, 1977, 24360 A/77
Int. Cl.³ B65D *21/06, 25/28*
U.S. Cl. 206—506 **3 Claims**

1. A handle for a wire basket, the wire basket having a first cross-bar in a horizontal plane at the top end of a side wall of the basket and having a second continuous cross-bar spaced below and parallel to the first cross-bar, the top cross-bar including two opposing free ends formed by a discontinuity of the top cross-bar along the side wall, the second cross-bar being continuous below the discontinuity, said handle comprising:

a first leg unitarily connected to a second leg forming an L-shaped body; a corner member spanning the interior angle formed by the first and second legs; an oblong hole through said corner member having two opposing arcuate end surfaces interconnected by two opposing side surfaces, the major axis of said oblong hole extending in a generally parallel direction to said first leg, one of said arcuate end surfaces being adjacent said second leg, one of said side surfaces being adjacent said first leg, said one of said arcuate end surfaces defining a first seat, the opposing arcuate end surface defining a second seat; said corner member having an end surface adjacent the intermediate length of said first leg; said end surface having an outwardly facing arcuate surface aligned with and in the same facing direction as said first seat and defining a third seat;

said oblong hole adapted to slidably receive one of said free ends of said first cross-bar, said third seat adapted to engage said second cross-bar when said handle is mounted on said basket with said first seat engaging said first cross-bar thereby firmly maintaining said handle in a first position on said basket, said first leg being substantially parallel to and exterior of said side wall and said second leg being transversely to and extending inwardly from said side wall in said first position, said handle in said first position functioning as a braket for supporting the bottom of another basket resting on said second leg; said corner member having a flared abutment surface offset from said third seat and said oblong hole in a location closer to said second leg than said first seat, said abutment surface being arranged, when said handle is mounted on the basket, to abut said second cross-bar in a second position of said handle, said first cross-bar being in engagement with said second seat in said second position with said first leg being transversely to and extending outwardly from said wall and with said second leg extending downwardly, interiorly of the side wall, said first leg in said second position functioning as a holder for the basket to which it is adapted to be mounted, said handle rotatable from said first position to said second position and vice versa when mounted to said side wall.

4,241,832

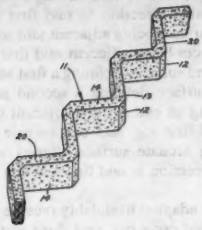
CUSHIONING FOR CONTAINER

Russell F. Bliss, 347-104th La. NE., Blaine, Minn. 55434

Filed Sep. 4, 1979, Ser. No. 72,563
Int. Cl.³ B65D *81/02, 85/30*
U.S. Cl. 206—523 **11 Claims**

1. A semi-rigid plastic cushioning strip having a wave shape and being adapted to fit singly or with other such strips within containers to cushion loads contained therein, the strip being formed integrally and in one piece of semi-rigid resilient foamed plastic, the wave shape of the strip defining crests and troughs extending across the entire width of the strip, and the strip also having wave shaped side edges to respectively engage the load and container, the strip including a multiplicity of substantially flat panels the width of which is the same as the width of the strip, the width of the strip significantly exceeding

the thickness of the panels, and the strip having planar surfaces extending entirely across the width of the strip at all of the



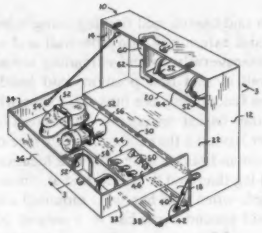
wave crests and troughs, such that the strip can be positioned on either side edge.

4,241,833

PARAMEDIC KIT

Dean E. Luebcke, 453 E. 101st Ave., Crown Point, Ind. 46307

Filed Aug. 20, 1979, Ser. No. 67,752
Int. Cl.³ B65D *6/02, 25/02, 43/16*
U.S. Cl. 206—570 **5 Claims**



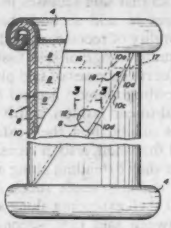
1. An airway kit, comprising:
end walls, base and top walls and a back wall;
a partition wall extending between said end walls and parallel to said base and top walls;
a front wall hinged to said partition wall pivotable to planularly extend said partition when in the open position, and to abut against said end and top walls when in the closed position;
a second front wall hinged to said base wall pivotable to planularly extend said base wall when in the open position, and to abut against said end and partition walls when in the closed position;
anchor means fixed to the interior side of said top front wall, said anchor means being a sheet member supported around the perimeter thereof and having a plurality of hole pairs;
oropharyngeal airways fitted in said hole pairs of said anchor means;
a plurality of straps fixed to the interior side of said front wall, the ends of each of said straps connecting together to form constraining means;
a block member on the interior side of said back wall; and
a mask from a bag mask resuscitator mounted on said block member.

4,241,834

COMPOSITE CONTAINER INCLUDING A PERFORATED LABEL LAYER, AND METHOD AND APPARATUS FOR FORMING THE SAME

Ronald A. Beauchamp, Creve Coeur, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Filed Apr. 20, 1977, Ser. No. 789,084
Int. Cl.³ B65D *3/26, 65/28, 75/62*
U.S. Cl. 206—611 **1 Claim**

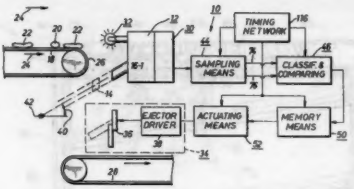


1. A composite container for a pressurized product such as dough and the like, comprising
(a) a helically-wound cylindrical body wall layer (**8**) formed of fibrous material and containing a helical butt joint (**12**) extending continuously the length thereof, the adjacent edge portions of said body wall layer defining said butt joint being contiguous and unbonded;
(b) a correspondingly helically-wound impervious liner layer (**6**) secured to and coextensive with the inner surface of said cylindrical body wall layer to bridge said butt joint, said liner layer (**6**) including a helically extending folded expansible portion (**6***a*, **6***b*) bonded to only said body wall layer on both sides of, and extending in straddling relation across, said body wall helical butt joint, one edge portion (**6***a*) of said liner layer terminating adjacent a first side of said body wall helical butt joint, the other edge portion of said liner layer having a first portion (**6***b*) which extends from the other side of said butt joint across and beyond said butt joint, and a reversely folded second portion (**6***c*) which extends between said one edge portion and said first portion back toward said butt joint, the fold line (**6***d*) between said first and second liner portions extending helically the length of said butt joint, the outer surface of said reversely folded second liner portion (**6***c*) being secured to the inner surface of said liner layer one edge portion to permit relative expansion of said first and second liner portions;
(c) a removable helically-wound edge-overlapping outer label layer (**10**) extending across the outer surface of said butt joint and secured to the outer surfaces of the abutting edge portions of said body wall layer substantially throughout the length of said butt joint, thereby to maintain together the body wall edge portions defining said unbonded butt joint, said helically wound liner, body wall and label layers defining a tubular composite wall; and
(d) a metal end closure member connected with said tubular composite wall to close one end thereof;
(e) said label layer containing a series of perforations (**16**) that defines a tear line which extends from the overlapping edge of said label layer circumferentially around the tubular composite wall adjacent and generally parallel with said metal end closure member, said series of perforations being discontinuous to define in said label layer an imperforate portion (**10***e*) which is bonded in straddling relation across said body layer butt joint, whereby upon removal of said label layer by tearing along said tear line, the butt joint is expanded by the pressurized packaged product to automatically open said liner layer.

4,241,835
SORTING APPARATUS

James F. Lockett, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Jul. 12, 1976, Ser. No. 704,697
Int. Cl.³ B07C 5/342
U.S. Cl. 209—582 12 Claims



1. In apparatus for sorting articles randomly disposed across an article stream, said apparatus having means for generating a first and a second electrical signal representative of light energy reflected from articles to be sorted, means for generating a classification signal functionally related to the ratio of said first and said second electrical signal, wherein the improvement comprises:

means responsive to equality between said first and said second electrical signals for generating a predetermined substitute classification signal;

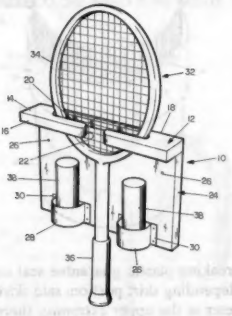
means for comparing the value of said classification signal with a predetermined range of values representative of a foreign object and for generating a reject signal responsive to the presence of a classification signal falling within said range, and,

wherein said predetermined substitute classification signal falls within said range of values.

4,241,836
UNIVERSAL RACKET RACK

Rebecca A. Cousins, 3744 Brookside Rd., Toledo, Ohio 43606

Filed Jup. 25, 1979, Ser. No. 51,401
Int. Cl.³ A47F 7/00
U.S. Cl. 211—14 2 Claims

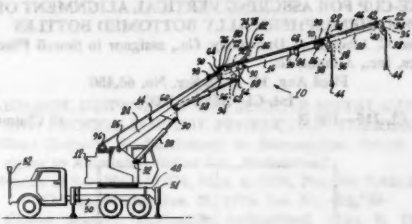


1. A universal rack for tennis rackets, squash rackets, badminton rackets, paddle ball rackets, and racketball rackets comprising an elongate horizontal member having a length exceeding its width and having two substantially parallel, planar upper and lower surfaces, an elongate slot extending longitudinally of said elongate member and extending between the upper and lower surfaces, said slot having a length less than the maximum transverse dimension across the net frame of the smallest racket to be held, said horizontal member also having an opening extending from one side of said slot to the adjacent edge of said elongate member, a vertical plate extending downwardly from the edge of said elongate member opposite the edge having the opening, and receptacles extending from said vertical plate and being symmetrically located with respect to said slot, said receptacles having substantially flat bottoms and being of sufficient size to receive cans of tennis balls held uprightly, and said receptacles being spaced substantially below said elongate member so that the cans will not interfere therewith.

4,241,837
CONVERTIBLE ARTICULATED CRANE

Don Suverkrop, 3513 Century Dr., Bakersfield, Calif. 93306

Filed Apr. 6, 1979, Ser. No. 27,793
Int. Cl.³ B66C 23/00
U.S. Cl. 212—177 22 Claims



1. An articulated crane comprising:

a base;

a main boom having a lower end and an upper end, and being pivotally secured to said base by said lower end;

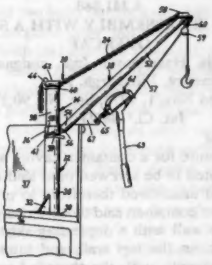
a secondary boom pivotally attachable to the upper end of said main boom, and having at least one extensible member; and

conversion means, for converting said crane for operation of said extensible member as an extension of said main boom, said conversion means including means for extension of said extensible member from either end of said secondary boom, and means for securing said main and secondary booms in a substantially parallel and folded relationship, with said extensible member forming an extension of said main boom, whereby said crane can be selectively operated as a straight boom crane.

4,241,838
HEIGHT-ADJUSTABLE HOIST

Calvin L. Hayes, 695 Suncrest Rd., Talent, Oreg. 97540

Filed Jun. 26, 1978, Ser. No. 919,426
Int. Cl.³ B66C 23/36, 23/62
U.S. Cl. 212—255 6 Claims



1. A height-adjustable hoist comprising an upright post, a hoist arm and mounting means mounting one end of said arm adjacent the top of said post with the arm extending outwardly from said post at an angle, said mounting means

including pivot means accommodating pivoting of the arm in a substantially upright plane,

a tip member mounted on said post for extension upwardly from said post and said mounting means,

hoist means including pulley means attached to the other end of said arm opposite said one end, a line trained over said pulley means and means for paying out and taking in said line,

nonextensible means extending from said tip member to a point on said arm spaced from said one end for establishing the angle of said arm relative to said post, and the extension of said tip member relative to said post, and

locking means for selectively varying the effective length of said nonextensible means.

4,241,839

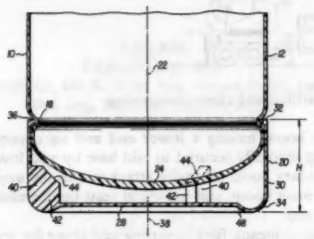
BASE-CUP FOR ASSURING VERTICAL ALIGNMENT OF SEMI-HEMISPHERICALLY BOTTOMED BOTTLES

Alfred C. Alberghini, Dunwoody, Ga., assignor to Sewell Plastics, Inc., Atlanta, Ga.

Filed Aug. 14, 1979, Ser. No. 66,450

Int. Cl.³ B65D *23/00*

U.S. Cl. 215—100 R **10 Claims**



1. A base-cup for supporting a bottle in an upright position, the bottle having a semi-hemispherical bottom and having a radial indentation in a lower portion of its otherwise generally cylindrical body, the base-cup comprising:

(a) a sole plate,

(b) a cylindrical side wall having an open top edge and a bottom edge smoothly merging into the sole plate,

(c) an annular bead on the inside of the top edge for engaging the radial indentation of the bottle body, and

(d) limit means for preventing the over-insertion of the bottle into the base-cup, the limit means comprising at least three circumferentially equally spaced and radially extending fillet webs joined to the side wall of the base-cup.

4,241,840

SAFETY CLOSURE ASSEMBLY WITH A SHEET METAL OVERCAP

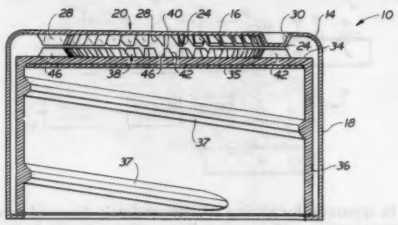
Wilburn C. Willis, Hagerstown, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 1, 1979, Ser. No. 90,273

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—220 **6 Claims**

1. A safety closure for a container having a threaded neck, said closure adapted to be screwed onto said neck for sealing the container and unscrewed therefrom to provide access to the contents of the container, said closure comprising: an inner cap having a top wall with a depending skirt therearound, a plurality of teeth on the top wall, and internal threads for cooperatively engaging with the threaded neck of the container; and an overcap of thin sheet metal having a top wall with a depending skirt therearound, a plurality of louvers in the top wall, each of which comprises a flange portion projecting downwardly at an angle from said top wall and terminating in a terminal edge which is defined by a slit in the top wall and an integral supporting arch portion connecting each side of the flange portion to the top wall between the terminal edge and the junction of the flange portion and the top wall, said louvers being adapted for cooperative engagement with the teeth of the inner cap; said overcap overlying and being loosely mounted on the inner cap whereby a downwardly directed minimal force may be applied to the overcap while turning it in



the closure-applying direction to engage the louvers of the overcap with the teeth of the inner cap and thereby screw the closure onto the container neck, and whereby a downwardly directed removing force must be applied to the overcap while turning it in the closure-removing direction to engage the louvers of the overcap with the teeth of the inner cap and thereby unscrew the closure from the container neck.

4,241,841

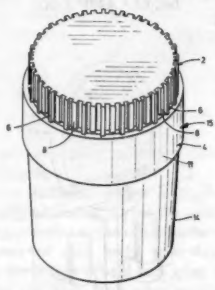
SEVERABLE CONNECTING MEANS

Peter K. Boller, Willowdale, Canada, assignor to Consumers Glass Company Ltd., Etobicoke, Canada

Filed May 7, 1979, Ser. No. 36,764

Int. Cl.³ B65D *41/48*

U.S. Cl. 215—252 **10 Claims**



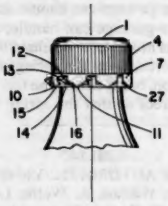
1. A twist breaking plastic guarantee seal comprising a cap portion and a depending skirt portion, said skirt portion having an inside diameter at the upper extremity thereof greater than the outside diameter of said cap portion and adapted for securement to a container neck exterior, interconnecting ribs joining and spacing said cap portion and skirt portion at spaced positions about the periphery of said cap, stop means located between the outside diameter of said cap portion and the inside diameter of said skirt portion adjacent the upper extremity thereof to predetermine the extent of axial movement of said cap portion relative to said skirt portion and the extent to which said ribs are flexed during application of said seal to a container, said ribs shearing on twisting said cap portion relative to said skirt portion to break said seal and allow said cap to be removed.

4,241,842

TAMPER INDICATING CONSTRUCTION FOR PLASTIC CLOSURES

Thurston H. Toeppen, Lois La., R.D. 3, Poughkeepsie, N.Y. 12603

Filed Aug. 6, 1979, Ser. No. 64,105
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 12 Claims



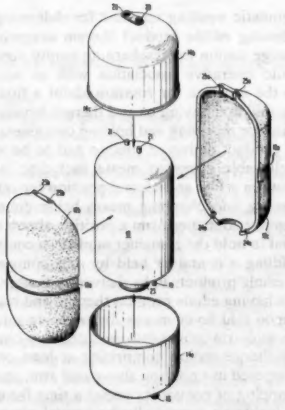
1. A tamper-indicating closure device for use with a threaded cylindrical outlet provided with a first shoulder, comprising a circular top surface and a cylindrical skirt depending therefrom, a device screw thread provided on said skirt for mating with the thread of said cylindrical outlet, at least one indicating portion on said device, an initial position of said indicating portion outside of the cylindrical surface of said skirt, a second position of said indicating portion inside of the cylindrical surface of said skirt, said indicating portion being movable radially of said skirt from said initial position to said second position, a tear zone of said device, a second shoulder on said indicating portion, whereby when said indicating portion is in the second position and when said second shoulder abuts said first shoulder, axial movement of said skirt with respect to said outlet causes said indicating portion to separate from the skirt at said tear zone.

4,241,843

LINED METAL TANK WITH HEAT SHIELD AND METHOD OF MAKING SAME

Robert Walker, Pawtucket, R.I., and Joseph A. Lane, Tauton, Mass., assignors to Amtrol Inc., West Warwick, R.I.

Filed Jun. 8, 1979, Ser. No. 46,763
Int. Cl.³ B23K *35/38*; B65D *8/06, 90/08, 90/38*
U.S. Cl. 220—5 A 14 Claims



13. In a method of making the metallic tank wherein a plurality of metallic sections are welded together surrounding a lining of insulating material on the interior of the tank, the improvement comprising the step of inserting a heat shield between the insulating lining and the juncture at which the sections are welded together before the welding step to prevent damage to the insulating layer due to the heat generated by the welding process, said insulating lining having retaining means for securement of said heat shield adjacent said juncture.

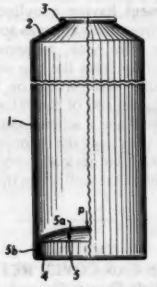
14. In a lined metal tank having a multi-section metallic tank of welded construction with an insulating lining disposed on the interior surface of the tank, the improvement comprising an insulating heat shield between the insulating lining and the juncture at which the multi-section tank is welded together to prevent damage to the insulating layer due to the heat generated by the welding process, said insulating lining having retaining means for securement of said heat shield adjacent said juncture.

4,241,844

AEROSOL DISPENSING AND SIMILAR METAL CANS, AND PROCESS FOR THE PRODUCTION THEREOF

Gilbert Dolveck, St. Barthelemy de Beaurepaire, France, assignor to Aluminium Suisse S.A., Switzerland

Division of Ser. No. 448,054, Mar. 4, 1974, Pat. No. 3,965,834.
This application Jun. 25, 1976, Ser. No. 699,793
Claims priority, application Switzerland, Mar. 8, 1973, 3380/73
Int. Cl.³ B65D *8/04, 8/08*
U.S. Cl. 220—67 8 Claims



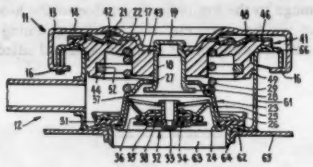
1. An aerosol dispensing or similar metal can for containing a fluid under pressure comprising, a tubular can body, a bottom having a dished central bottom portion and a peripheral skirt extending in a direction toward a bottom end of said can body, said central bottom portion being dished in a direction away from said skirt, said can body having a sidewall having a lower, circumferential marginal edge portion reversely folded inwardly to define with said sidewall a channel, said skirt having a peripheral edge seated against an inner bottom surface of said channel, said marginal portion defining said channel comprising an inner edge portion bent relative to said channel circumferentially of the channel defining an outer surface outwardly of said channel remotely from the bottom surface of said channel spaced axially from said dished central portion and disposed in a position to be engaged by said dished central portion upon deflection in a direction away from the top of the can when a given internal pressure in said can is exceeded, said outer surface upon engagement by the central portion effectively applying said edge portion in a direction toward said skirt in said channel and against said skirt, and said outer surface being disposed in position for engagement by said dished central portion upon deflection thereof for retention of said marginal edge portion in position defining said channel.

4,241,845

RADIATOR CAPS

Andrew S. Daly, Ivanhoe; Peter R. May, Springvale South, and George E. Braines, East Preston, all of Australia, assignors to A.S. Daly Nominees Pty. Ltd., Fairfield, Australia

Filed Jul. 2, 1979, Ser. No. 54,173
Claims priority, application Australia, Sep. 15, 1978, PD5972
Int. Cl.³ B65D *51/16, 53/02*
U.S. Cl. 220—203 **11 Claims**



1. A radiator cap assembly for fitting to a radiator filler neck having a tubular side wall and an internally projecting, upwardly facing, annular ledge positioned at the bottom of the side wall and surrounding a filler opening, said assembly comprising:

a cap to fit over the upper end of the filler neck;

an annular first seal element;

seal mounting means mounting said first annular seal element from the cap so as to engage the ledge of the filler neck when the cap is fitted to the filler neck and including biasing means to load the sealing member against the ledge so as to form a primary seal; and

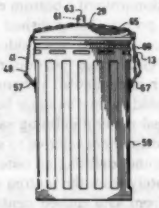
a second seal element having a cylindrical skirt portion extending away from the cap so as to project within the side wall of the filler neck, an annular flange portion projecting outwardly from the cap end of the skirt portion, a first annular seal surface on the annular flange portion to engage the rim of the filler neck at the upper end of said side wall and a second annular seal surface on said skirt portion to engage the inner peripheral surface of the side wall of the filler neck and thereby form a circumferential seal around that wall when the cap is fitted to the filler neck.

4,241,846

GARBAGE CAN COVER RETAINER

William Murphy, DaCola Shores, Conesus, N.Y. 14435

Filed Oct. 16, 1978, Ser. No. 951,643
Int. Cl.³ B65D *45/08*
U.S. Cl. 220—318 **8 Claims**



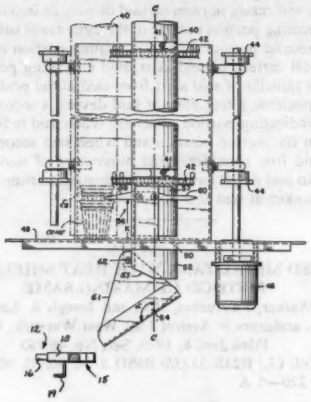
1. A covered garbage can with a cover being retained firmly in position thereon which comprises a garbage can having a pair of handles on opposite sides thereof, near the top thereof, a cover having a substantially centrally located handle on the top thereof, which cover is in position covering the garbage can, with the handle opening thereof being cut by a vertical plane passing through the middles of the can handles, and a retainer for holding the cover in position on the garbage can, which retainer includes a readily disconnectable first holding means of hook shape, a plurality of connected links connected to said first holding means and forming a chain extending from it, a spring means connected to said chain away from the first holding means, plus a disconnectable second holding means connected to the spring means and adapted for holding onto a handle of the garbage can, said retainer being passed through the cover handle, said second holding means holding onto a garbage can handle, said chain being passed through an opening between the other garbage can handle and the garbage can, and around the other garbage can handle, and the first hook shaped holding means holding to the chain to hold the cover in place with desired force, with the spring means, in normally most extended position, being below the top of the garbage can cover at the side thereof so that the spring is unbent.

4,241,847

ICE CREAM CONE AUTOMATIC VENDING MACHINE

Frederick N. Lancia; William A. Wolfe; Leonard F. Dearth; Stephen L. Benton; H. Richard Homan, and Arthur P. Bruce, all of 1050 Dearborn Dr., Columbus, Ohio 43229

Filed Mar. 29, 1978, Ser. No. 891,315
Int. Cl.² G07F *11/54, 11/10*
U.S. Cl. 221—12 **3 Claims**



1. An automatic vending machine for delivering stackable containers having edible product therein comprising a container discharge station for discharging empty containers one at a time into operative association with an arm pivotally mounted to the machine for rotation about a first, generally vertical axis; said arm having an end thereof having container-holding means for receiving and holding containers adapted to have edible product delivered thereto and to be vended and including releasable clamping means including lever means movable between a first and second position for releasing said clamping means; said clamping means being dimensioned to receive an empty container from a position above said clamping means and to hold the container in place; a container filling station for filling a container held by said container-holding means with edible product; and a delivery chamber for receipt of containers having edible product therein; and release means for acting upon said lever means for releasing said clamping means when said arm moves into said delivery chamber; said container discharge station comprising at least one stack of containers disposed in a position above said arm, and means for effecting dropping of containers one at a time from said stack to said arm including a generally horizontal plate having an opening formed therein greater than the largest diameter of a container to be passed therethrough; guide means located vertically between said at least one container stack and said arm for guiding dropping of containers into operative associa-

tion with said arm clamping means so that said containers will not be misaligned or inverted during dropping and will be positively guided into operative association with said arm clamping means; said guide means including a generally tubular member disposed below said at least one container stack and having one end thereof directly vertically below said at least one container stack, and having a chute disposed vertically below the other end of said generally tubular member, said chute having a generally open top and having a primary container-guiding portion thereof extending downwardly from said tubular member and disposed at an obtuse angle with respect to the vertical; wherein the improvement comprises:

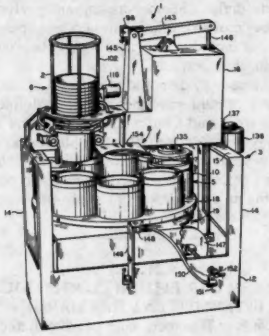
a planar, vertical bracket integral with said chute over substantially the length thereof, said chute being semi-circular in shape; and means for operatively releasable attaching said bracket to and beneath said generally horizontal plate of said container discharge station, said attaching means being horizontally displaced from, and distinct from, said tubular member of said guide means, and mounting said chute so that it is vertically displaced from said tubular member over the entire length thereof.

4,241,848

CONTAINER PROCESSING APPARATUS

Jerry W. Young, Weston, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 798,049, May 18, 1977, Pat. No. 4,143,610.
This application Dec. 27, 1978, Ser. No. 973,767
Int. Cl.³ B65G *59/10*
U.S. Cl. 221—222 **9 Claims**



1. Apparatus for dispensing tapered containers, said apparatus including:

support means;

a plurlity of pairs of jaws movably carried by said support means with each said pair of jaws forming a respective container receiving opening and one said pair of jaws being positioned above and spaced apart from another said pair of jaws, the jaws in each pair being relatively movable between an open position and a closed position and the jaws of one pair of jaws being movable independently of the jaws of another pair of jaws;

first means positioned adjacent to and above said jaws and adapted for storing a plurality of containers;

second means operably associated with said jaws and operable for effecting the movement of said jaws;

third means positioned below said lower disposed pair of jaws and having a portion thereof adapted for engagement with a side wall between a top edge and a bottom edge of one of said containers for selectively urging downward movement of said container; and

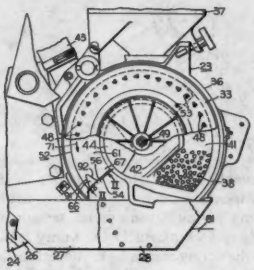
power means operably associated with said third means and operable for driving said third means to selectively urge a container engaged by said third means downwardly when the jaws of said lower disposed pair of jaws are in the the open position, and, alternately, for stopping said third means to selectively prevent the urging of a container engaged by said third means downwardly when the jaws of said lower disposed pair of jaws are in the closed position.

4,241,849

AIR CUT-OFF PAD FOR AN AIR PLANTER WITH SEED DISCHARGE FEATURE

Paul H. Harrer, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 7, 1979, Ser. No. 36,667
Int. Cl.³ A01C *7/04*
U.S. Cl. 221—266 **3 Claims**



1. An air planter of the type having a housing with a seed cavity to which bulk seed and pressurized air are supplied and a seed drop portion at the lower part thereof and a vertical seed singulating disk rotatable about a horizontal axis having a generally flat sealing face presenting circumferentially spaced seed pockets which sequentially communicate with said seed cavity and said seed drop portion when said disk is rotated in a predetermined direction, characterized by

a resilient air cut-off pad of predetermined thickness in the direction parallel to the axis of said disk, said pad being interposed between said housing and disk with a trailing edge adjacent said seed drop portion,

a flat sealing surface on said pad in resilient sealing engagement with the flat face of said disk whereby said seed pockets are brought into confronting relation with said sealing surface of said pad as said disk is rotated in said predetermined direction, and

an area of gradually decreasing thickness in said pad beginning at said sealing surface, extending in said predetermined direction a predetermined distance and terminating at said trailing edge, said area of decreasing thickness being disposed to confront said seed pockets as said disk is rotated in said predetermined direction whereby the seeds in said pockets are substantially relieved of pressure of contact with said resilient pad as each pocket passes across said area of decreased thickness and across said trailing edge to said seed drop portion of said housing.

4,241,850

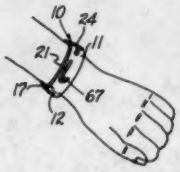
PERSONAL PROTECTIVE DEVICE

Eugene M. Speer, c/o Mr. Donald W. Hedrick P. O. Box 2631, Orlando, Fla. 32803; Paul G. Hahn, 693 Granville Dr., Winter Park, Fla. 32789

Continuation of Ser. No. 633,124, Nov. 18, 1975, abandoned.
This application Sep. 21, 1978, Ser. No. 944,636
The portion of the term of this patent subsequent to Dec. 30, 1994, has been disclaimed.
Int. Cl.³ B67B *7/24*
U.S. Cl. 222—39 **10 Claims**

1. A personal protective repellent dispensing device comprising an exterior housing member of attractive appearance in

the form of an article which normally is conveniently carried as an accessory by a person in a readily accessible manner and which disguises the nature of the device, container means for containing a fluid substance of foul and repulsive nature within the exterior housing member, said exterior housing member having at least one outlet opening to the exterior thereof communicating with said container means, selectively controllable dispensing means coacting with said container means for releasing a fluid substance contained therein through the outlet opening under the control of a person carrying the device, and positive acting safety lock means on said housing member for



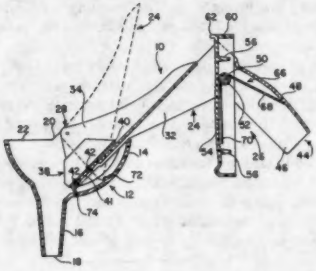
positively preventing inadvertent actuation of the selectively controllable dispensing means, said positive acting safety lock means including spring means under tension for positively locking the safety lock means in the safety lock position and requiring that the spring means be tensioned further in order to change the selectively controllable dispensing means from a safety locked position to a ready armed detent position where it can be selectively and readily operated by a person carrying the device in situations where it is desired to arm the device and condition it for operation by the selectively controllable dispensing means alone.

4,241,851

ADJUSTABLE OIL FUNNEL

Howard Ibaraki, Monterey Park, Calif., assignor to Orion Industries, Inc., Compton, Calif.

Filed May 15, 1979, Ser. No. 39,395
Int. Cl.³ B67B 7/28
U.S. Cl. 222—83.5 **4 Claims**



1. An oil dispensing device for an internal combustion engine comprising:

a cradle formed with a chute that has an upwardly directly piercing blade at a lower end and a trigger mechanism at an upper end for forcing an oil can down said chute and onto said piercing blade,

a funnel having a concave bowl with a wide mouth located above a narrow spout, and said bowl drains into said narrow spout, and said chute is provided with a tooth at its lower extremity directed toward said bowl, and

said funnel and said cradle are equipped with releasable interacting rotating means to rotatably mount said cradle to said funnel with said lower end of said chute within said funnel, and

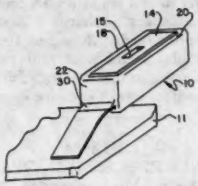
said bowl of said funnel includes an outwardly directed stop on its concave wall to limit upward rotation of said chute relative to said funnel.

4,241,852

DISPENSING CONTAINER FOR BUTTER HAVING FOLLOWER

Stanley J. Klem, 2607 Wyndham La., Orlando, Fla. 32808

Filed Mar. 1, 1978, Ser. No. 882,348
Int. Cl.² B65D 35/28
U.S. Cl. 222—103 **5 Claims**



5. A dispensing container for dispensing softened butter or similar material from pre-packaged envelopes, the dispensing container comprising:

a frame including a base, a first and a second enlongated side wall integral therewith spaced apart by a front and a rear end wall to define chamber having an aperture;

a feed member movable relative to said base spans said frame aperture and includes an orifice for venting entrapped air within said chamber; and

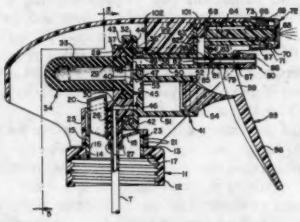
a sealable passageway disposed at one end of said frame, the upper limit of said passageway being defined by a lip projection from said front wall and the lower limit of said passageway being defined by a flexible base extension that projects beyond said front wall, said flexible extension including a sealing edge biased against said projecting lip for pinching an end portion of the pre-packaged envelope disposed therebetween.

4,241,853

DISPENSER FOR EITHER CONTINUOUS OR INTERMITTENT DISCHARGE

James D. Pauls; Roy Hammett, both of Miami, and William S. Blake, Miami Lakes, all of Fla., assignors to James D. Pauls and J. Claybrook Lewis and Associates, Limited, Miami, Fla.

Filed May 17, 1978, Ser. No. 906,747
Int. Cl.² B05B 11/02
U.S. Cl. 222—207 **20 Claims**



1. An economical, easy to use, duration and/or continuous action dispensing device, comprising: a manifold member having fastening means thereon for securing the manifold member to a container; first expansible chamber means carried by the manifold member and including actuator means operable to alternately draw material from a container and then

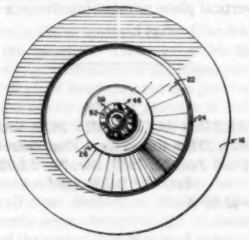
pressurize it; second expansible chamber means carried by the manifold member for receiving pressurized material from the first expansible chamber means and accumulating, under pressure, a quantity of the material for subsequent, prolonged discharge; a stationary discharge nozzel connected to receive the pressurized material from the second expansible chamber means and discharge valve means connected with the second expansible chamber means, and having a first position for precluding flow from the second expansible chamber means, and a second position enabling flow from the second expansible chamber means to the nozzle for discharge as desired, said discharge valve means including selectively operable latching means for holding the discharge valve means in its second position during operation of the actuator means to obtain a continuous discharge, said dispensing device being attachable to existing, conventional containers.

4,241,854

LIQUID DISPENSER

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425, and Owen Van Brocklin, Bristol, Conn., assignors to Robert A. Bennett, Easton, Conn.

Filed Nov. 26, 1979, Ser. No. 97,733
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—207 **6 Claims**



1. A dispenser for use with a container of liquid having a vertical neck open at the top, said dispenser comprising:

a horizontal flexible diaphragm having a downwardly extending peripheral lip adapted for detachable sealing engagement with the periphery of the open neck whereby the diaphragm covers the neck opening, said diaphragm having a top disposed concave cup-like recess inwardly spaced from said lip centrally disposed therein with a central hole at the bottom thereof;

a vertically elongated hollow tubular element having an outwardly flared upper section disposed adjacent but spaced below the diaphragm and adapted for detachable sealing engagement with the periphery of said lip, said section having a side wall which defines an inverted truncated cone with spaced longitudinally extending slots therein, said element having a lower vertical hollow section with an upper opening coincident with the lower end of said cone and a lower opening adapted to extend into the container below the level of the liquid, the element also having a vertical bore extending therethrough, said bore having a first constriction which permits the passage of liquid therethrough disposed in the lower section adjacent but below the upper opening thereof, the bore wall containing a vertical cylindrical recess (spaced outwardly from the interior of the bore and spaced inwardly from the outer surface of the lower element) which communicates at its top end with the interior of the cone and has a closed bottom end disposed below said first constriction;

a vertically elongated hollow tube sealed to and extending through said hole has an open top end disposed above said hole in the concave recess and an open bottom end always disposed in the vertical recess, said tube being vertically slidable in said vertical recess, said tube having in its hollow interior a second constriction disposed intermediate the ends thereof, said top tube end having a plurality of horizontal spaced conduits interconnecting the interior of the tube with the interior of said concave recess; and

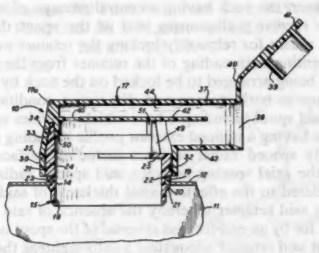
a vertical prong disposed in said bore and the tube interior, the bottom end of the prong being secured in said first constriction without obstructing liquid passage therethrough, the top end of the prong being disposed above and larger than the second constriction, the main body of said prong being slidable through said second constriction with sufficient clearance to permit liquid to flow around said body through said second constriction, said tube having a normal raised position at which the second constriction and said top end are in sealing engagement and define a closed valve through which said liquid cannot pass, said tube having a momentarily lowered position at which said top end is spaced above the second constriction to open said valve and permit passage of said liquid therethrough.

4,241,855

FLOW CONTROLLING POURING SPOUT

Yu Yoshioka, Los Angeles, Calif., assignor to Kikkoman Foods, Inc., Elkhorn, Wis.

Filed Apr. 16, 1979, Ser. No. 30,121
Int. Cl.³ B67D *3/00*; B65D *47/00*
U.S. Cl. 222—479 **10 Claims**



1. A flow-controlling pouring spout assembly adapted to be applied in flow-controlling relation to a discharge opening in a pourable contents container, said assembly comprising:

a base member having means for retaining engagement with the container in flow-controlling relation to said opening;

said base member having a flow passage therethrough initially closed by rupturable means extending across the flow passage;

a pouring spout member having a discharge port opening generally radially therefrom;

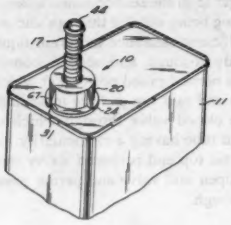
and means separably connecting said pouring spout member in snap-on, snap-off and relatively swiveling relation on said base member for receiving and directing container contents flow from said base member passage through said port and permitting said spout member to be selectively swiveled relative to said base member for orienting said port in different radial directions relative to said base member;

said pouring spout member being adapted to be snapped from said base member for access to and removal of said rupturable means for opening said passage, whereafter the pouring spout member is adapted to be snapped back into swiveling connection with said base member for cooperating with the base member in directing flow of container contents from the opened base member passage.

4,241,856
CHILD-RESISTANT FLUID TOP

Lewis L. Otterson, Chagrin Falls, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Feb. 16, 1979, Ser. No. 12,835
Int. Cl.[3] B65D 25/50; B67D 3/00
U.S. Cl. 222—539 8 Claims



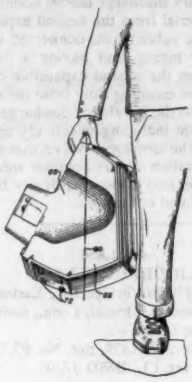
1. A container closure for fluids comprising a hollow neck, a spout for dispensing fluid from the neck, a cap for closing said neck during storage of the container and its contents, an apertured retainer threadable onto the neck for alternatively retaining the spout and cap or the spout on the neck, the spout having a radial flange dimensioned to prevent its passage through the aperture of said cap, said cap being sufficiently large to close said aperture, the aforementioned elements being constructed and arranged such that in a storage condition the flange and cap are successively assembled on the neck and held thereon by the retainer and in a dispensing condition the flange is assembled on the neck without the cap and held thereon by the retainer, the neck having a central passage of a size sufficient to receive a dispensing end of the spout thereon for storage, means for releasably locking the retainer on the neck by preventing unthreading of the retainer from the neck, said retainer being arranged to be locked on the neck by said locking means in both storage and dispensing conditions of the spout, said spout including a base which provides said flange, said base having a stepped exterior profile including a plurality of axially spaced radial surfaces including surfaces of said flange, the axial spacing between said spaced radial surfaces being related to the effective axial thickness of said cap measured by said retainer whereby the absence of said cap is accounted for by an end-for-end reversal of the spout on the neck such that said retainer adequately axially tightens the elements assembled on said neck while indexing to the same angular and axial position with respect to said neck and said locking means in both storage and dispensing conditions of said spout.

4,241,857
SADDLE BAG

Charles Perethian, Arroyo Grande, and Craig W. Vetter, Shell Beach, both of Calif., assignors to Vetter Corporation, Rantoul, Ill.

Filed May 1, 1978, Ser. No. 901,321
Int. Cl.[3] B62J 7/00
U.S. Cl. 224—32 A 10 Claims

1. A saddle bag for a motorcycle, a body having a wide bottom wall consisting of two angularly disposed parts and a narrow top wall, a pair of side walls connecting said bottom wall to said top wall, said side walls converging from said wide bottom wall to said narrow top wall, a pair of end walls closing the ends of said body, an access opening through one side wall, a door hinged to said one side wall along the lower edge of said access opening, one of said parts of the bottom wall lying substantially perpendicular and adjacent to said one side wall, means carried by the other side wall for securing the bag to a motorcycle, and a handle mounted adjacent the intersection of said other side wall and the top wall, which said handle is used for carrying said bag when said bag is detached from said motorcycle, said handle lying parallel to said other side wall and being located on a vertical axis passing through the center of gravity of said bag with said door closed over said access opening in said one side wall and with said door and said one side wall lying in a substantially vertical plane parallel to said

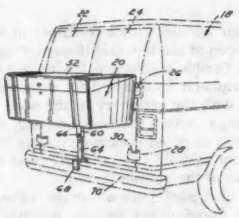


vertical axis whereby said bag can be carried with the closed door in said vertical plane without interference with the leg of a carrier.

4,241,858
CARRIER ACCESSORY FOR VANS

George Lawroski, 23208 Raven Ave., East Detroit, Mich. 48021

Filed Jun. 22, 1979, Ser. No. 51,023
Int. Cl.[3] B60R 9/04
U.S. Cl. 224—42.03 A 8 Claims



1. A carrier accessory combination for vehicles which comprises in combination:

(a) a van-type vehicle having a body and rear swing doors which open from the center and a rear bumper,

(b) hinge loops on the outside edges of said doors extending rearwardly from the surface of the van body and doors,

(c) a support bracket having a horizontal member to extend across said doors substantially to span the distance between hinges of said respective doors,

(d) first load carrying means including a depending member adjacent but spaced from each end of said horizontal member to project over and into a hinge loop of the van body,

(e) second load carrying means associated with said horizontal member comprising a vertical member to serve as a supplemental vertical load carrier and tie down means to stabilize said horizontal member vertically on said body, said vertical member being supported on said rear bumper, and

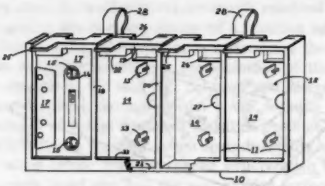
(f) carrier means supported on said bracket to serve to carry sporting gear and the like.

4,241,859

MOUNTABLE CASSETTE OR CARTRIDGE HOLDER

Thomas R. Eames, 4503 Wilburn Dr., South Euclid, Ohio 44121

Filed Nov. 30, 1977, Ser. No. 856,190
Int. Cl.[3] B60R 7/00
U.S. Cl. 224—312 2 Claims



1. A tape cassette or cartridge holder for attachment to the sun visor of a motor vehicle as a mounting surface in such a way that the flat side of the cassette or cartridge (perpendicular to the axis of the tape reels) is closest to the flat side of the mounting surface, comprising a frame, or several frames joined side-by-side, of resilient material such as plastic, consisting of:

(a) A back;

(b) Peripheral upstanding wall members connected to the back;

(c) Tabs on two walls at opposed ends of the frame to overlie and retain the cassette or cartridge within the frame;

(d) One wall which is attached to the frame on only one side so that it will pivot freely around the point of attachment to control the retention of the cassette or cartridge in two perpendicular axes of motion and allow the item being held to be removed in a direction perpendicular to the back of the frame without further movement of the remaining upstanding walls when the movable wall is pushed a sufficient distance so that the retaining tab no longer extends over the cartridge or cassette, and the resilience of the material of that wall acting as a spring to return it toward its original position when pressure is removed;

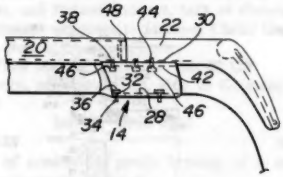
and fastened to the mounting surface by a clip or other suitable mounting device so that the back of the frame is adjacent to the flat portion of the mounting surface.

4,241,860

ARTICLE CARRIER STANCHION

Charles E. Ingram, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.

Filed Mar. 19, 1979, Ser. No. 22,060
Int. Cl.[3] B62D 33/00
U.S. Cl. 224—316 1 Claim



1. A vehicle article carrier device comprising:

an upright stanchion having a longitudinally disposed planar bottom wall conforming to a vehicle surface on which the carrier is mounted,

an upstanding side wall integral with the bottom wall,

a pair of end walls integral with the bottom and side walls,

an enlarged top wall integral with the side wall and the end walls,

the lengths of the bottom wall, the top wall and the side wall being generally equal,

the height of said end walls being less than the length of said top wall;

fastener means coacting with the bottom wall for attaching said stanchion to the vehicle surface;

a longitudinally extending side rail having one end supported upon the top wall of the stanchion, said one end terminating intermediate the stanchion end walls;

fastener means for attaching the side rail to the stanchion top wall;

an air deflector blade disposed transversely of said side rail;

a deflector blade support arm having

a longitudinal section aligned with and having the cross-sectional shape of said side rail, said longitudinal section including one end supported on the top wall of the stanchion, said one end terminating intermediate the stanchion end walls and in abutment with the one end of said side rail,

said support arm terminating in an integral end portion depending from the longitudinal section, the length of said end portion being substantially equal to the height of the deflector blade;

fastener means for attaching the deflector blade support arm to the stanchion top wall; and

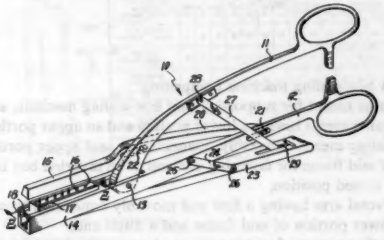
means for pivotally connecting the deflector blade to said support arm at the junction of the longitudinal section and the depending end portion whereby said blade may pivot relative to said support arm.

4,241,861

SCISSOR-TYPE SURGICAL STAPLER

Harry N. Fleischer, 700 Park Ave., New York, N.Y. 10022

Filed Dec. 20, 1977, Ser. No. 862,387
Int. Cl.[3] B25C 5/02
U.S. Cl. 227—135 2 Claims



1. A surgical stapler comprising an elongated cartridge housing of channel cross-section, said cartridge housing being adapted to hold at the open upper end of said channel a staple cartridge containing a plurality of staples positioned in a line along the length of the cartridge housing, said staple cartridge having the staples thereof positioned at the upper portion of the cartridge overlying a lifter which, when lifted, will cause the ejection of all of the staples, movable lifting rods extending across the lower portion of the channel of said cartridge housing, and means movable at an angle to the movement of said rods to cause said rods to be elevated to lift said lifter.

2. A scissor-type surgical stapler comprising a pair of pivotally connected forcep handles movable from an open position to a closed position, an elongated cartridge housing of channel shape at the forward end of one of said forcep handles, said cartridge housing being adapted to hold a staple cartridge containing a plurality of staples positioned in a line along the length of the cartridge housing, actuator means associated with said cartridge housing for operating said staple cartridge to cause the ejection of staples therefrom, said actuator means being constituted by a U-shaped member embracing the exterior of said cartridge housing, an anvil positioned in parallel

apposition to said cartridge housing in line with the staples to be ejected from said staple cartridge, said anvil and said cartridge housing being interlinked so as to be relatively movable toward and away from each other while maintaining said parallel apposition as said handles are moved between said open and closed positions, and said cartridge housing and U-shaped actuator having at least one pair of crossing slots with a rod extending through each of said pairs of crossing slots and through the lower portion of the channel of said cartridge housing to underlie the staple cartridge when it is positioned in said cartridge housing, to operate said actuator means.

4,241,862

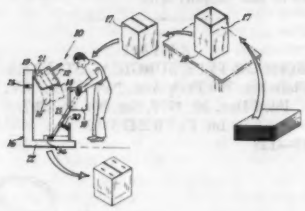
BOX SEALING DEVICE

Harry Barnett, 2990 SW. 22nd St., Fort Lauderdale, Fla. 33312

Filed Apr. 12, 1979, Ser. No. 29,453

Int. Cl.³ B25C *7/00*

U.S. Cl. 227—155 **4 Claims**



1. A box sealing machine comprising:

a frame means for supporting said box sealing machine, said frame means having a lower portion and an upper portion,

a sealing means adjustably connected to said upper portion of said frame for fastening one end of an inverted box into a closed position,

a pivotal arm having a first end movably connected to said lower portion of said frame and a distal end,

a platform means for supporting and positioning the inverted box, said platform means connected to said distal end,

said pivotal arm and said platform means having a load position and a sealing position,

said platform means is sized and shaped to receive the inverted box from an operator in said load position and fix the position of the inverted box relative to said platform means,

said pivotal arm and said platform means positioned near the operator in said load position,

said pivotal arm means including means for allowing movement to and return from said sealing position by the operator initially pushing the inverted box and said platform means toward said sealing means,

said platform means sized and positioned to stop and position the inverted box on said platform means in contact with the sealing means without aid of the operator, after the initial push,

said sealing means actuated by said inverted box and said platform means engaging said sealing means,

said sealing means positioned substantially parallel to said inverted box on said platform means when stopped and sealed by sealing means in said sealing position.

4,241,863

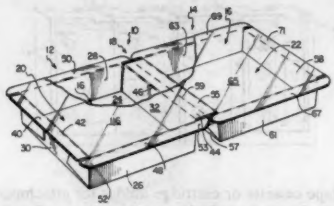
CONTAINER WITH MULTIPLE COMPARTMENTS

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 5, 1979, Ser. No. 45,823

Int. Cl.³ B65D *85/54, 5/48*

U.S. Cl. 229—27 **7 Claims**



1. A container comprising:

(a) first and second symmetrical compartments formed from a single blank of paperboard material, and hingedly coupled together,

(b) each of said compartments having a bottom wall, two end walls, each coupled to an opposite end of said bottom wall, and two side walls, each coupled to an opposite side of said bottom wall,

(c) a set of four flanges on each compartment, each flange hingedly coupled to the top of one of said compartment walls,

(d) a film covering each of said compartments, said film being attached to the four flanges thereon,

(e) said first and second compartment coupling hinge connecting together a corresponding one of said flanges on each compartment whereby said compartments maybe folded about said hinge and superimposed over each other with said film in a face-to-face relationship, said folded compartments having a generally hexagonal cross-section, and

(f) a sleeve cover for said container when said first and second compartments are folded about said hinge and superimposed over each other whereby said compartments are maintained in said superimposed relationship when placed within said sleeve.

4,241,864

CONTAINER END CLOSURE SYSTEM

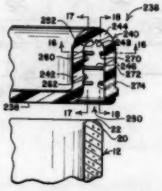
Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Continuation of Ser. No. 801,204, May 27, 1977, abandoned.

This application Mar. 5, 1979, Ser. No. 17,531

Int. Cl.³ B65D *5/64*

U.S. Cl. 229—43 **6 Claims**



1. A molded end closure of organic polymeric material for a tubular container formed from identable material, comprising a central section, an integrally formed peripheral rim extending about a closure axis, the rim being of generally U-shape cross-section and providing a bight and a pair of peripherally extending legs for straddling and snugly engaging a peripheral wall of a tubular container, the legs and bight cooperating to define an

annular slot of narrow radial dimension for receiving end wall portions of a container tube having substantially the same said dimension, the legs and bight providing a continuous surface which is exposed inside the slot, and macroscopic surface irregularity means formed on said surface as discrete, spaced structures for projecting away from said surface toward and into firm indenting engagement with the container end wall portions when the wall portions are snugly received in the slot for enhancing the bonding action of a bonding agent introduced between the said continuous surface and the wall portions by initiating bonding in the vicinities of the discrete, spaced structures, the said legs between said discrete spaced structures defining circumferential zones forming capillary-like passages with said container end wall portions thereadjacent, whereby the bonding action spreads rapidly away from the vicinities of the discrete, spaced structures to effectively continuously bond and seal the said closure surface portions and the container end wall portions.

4,241,865

RECLOSABLE SHIPPING SACK AND METHOD

Robert A. Ferrell, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Filed Aug. 6, 1979, Ser. No. 64,044
Int. Cl.³ B65D *33/26*
U.S. Cl. 229—62 **22 Claims**

1. A reclosable sack having a mouth from which discrete pourable contents may be poured, comprising:

a primary non-reclosable stitched separable closure fastener across and closing said mouth against unintentional discharge of the contents and including means for facilitating digital opening of the primary closure fastener;

and a secondary, reclosable fastener across said mouth outwardly from said primary closure fastener and adapted for selectively opening and closing said mouth, after opening of said primary closure fastener.

4,241,866

METHOD OF GENTLY CONTROLLING BRAKING OF A CENTRIFUGE, AND BRAKING SYSTEM

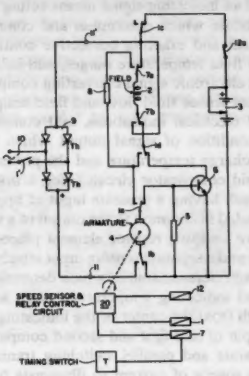
Frank Giesbert, and Roland Kuhnert, both of Osterode, Fed. Rep. of Germany, assignors to Heraeus Christ GmbH, Osterode, Fed. Rep. of Germany

Filed May 18, 1979, Ser. No. 40,120
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2824045
Int. Cl.³ B04B *9/02*
U.S. Cl. 233—24 **15 Claims**

1. Method of controlled, gentle braking of a centrifuge comprising the sequential steps of

initiating and maintaining a first braking phase in which the centrifuge is braked by application of a first, higher braking torque until the rotational speed thereof has reached a first predetermined value which is substantially below the operating speed of the centrifuge;

then initiating and maintaining a second braking phase during which the centrifuge is braked by applying a second and lower braking torque until the rotational speed thereof has reached a second predetermined value which is substantially below said first speed value;



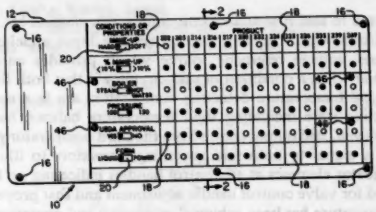
and then discontinuing application of the braking torque to the centrifuge.

4,241,867

SLIDE RULE

Robert H. Wolf, Barrington, and Madeleine L. Dugas, Palatine, both of Ill., assignors to Graphic Calculator Company, Barrington, Ill.

Filed Jun. 19, 1979, Ser. No. 49,973
Int. Cl.³ G06C *3/00*
U.S. Cl. 235—85 R **6 Claims**



1. A slide rule comprising:

(a) a back cover;

(b) a front cover having formed therein a plurality of viewing apertures and a plurality of stylus apertures;

(c) a central filler positioned between the front and back cover and having formed therein an elongated opening;

(d) means, associated with the front and back cover and the central filler, for rigidly fastening the covers and the filler together; and

(e) a plurality of movable elongated slides positioned within the elongated opening and having formed therein stylus openings, each slide also having formed thereon predetermined zones of different indicia for viewing through the viewing apertures.

4,241,868

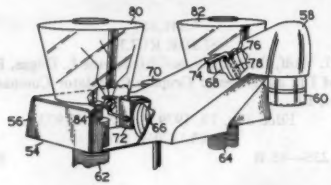
FLUID TEMPERATURE MIXING INDICATOR

Jean K. Perkins, P.O. Box 10-1869, Anchorage, Ak. 99511

Continuation-in-part of Ser. No. 799,148, May 23, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,689
Int. Cl.³ G05D *23/00, 11/00*
U.S. Cl. 236—12 A **14 Claims**

1. A plumbing fixture device comprising; an apparatus of fluid valves having control handles to control and combine hot

and cold fluids, an encompassing valve body to include fluid inlets and mixing chamber with an outlet for emitting fluid discharge, and an indicating signal means acting as an integral part of said fixture which determines and communicates the acknowledgment and exacting corrective control needed to achieve preset fluid temperature ranges, said indicating means comprising an electronic signal converting comparator circuit which translates sensed fluid flow and fluid temperatures into predetermined electrical indications, said comparator circuit providing a condition of signal output which is dependent upon fluid discharge temperature and the presence of a fluid flow signal, said comparator circuit being a first and second comparator, each having a separate input of opposite sensing polarity connected in common to the output of a voltage dividing temperature sensitive resistor element placed in the fluid discharge path and a separate sensing input attached to a single voltage dividing reference source which determines both center of a desired indicating temperature range and maximum threshold width from the center of the indicating temperature range, the output of said first and second comparator circuits activating separate and parallel switching transistors that in turn provide a source of current to illuminate bulb indicator elements at control handles according to input signal amplitude, a third comparator having a separate sensing input con-



nected to said first and second comparator outputs by suming resistors with a separate second sensing input attached to a preset voltage reference source which provides an output action when a condition of said circuitry is that both first and second temperature detecting comparators are in a non-conducting state indicating fluid temperature balance has been achieved, said output action from the third comparator providing a signal to both said switching transistors to illuminate indicator elements at all control handles indicating no further need for valve control handle adjustment and that proper fluid temperature has been achieved, activation and operation of all said temperature detecting comparators and described circuits being dependent upon a fluid flow switch consisting of an exposed resistance element placed in the fluid discharge path whereby another comparator translates the sensed fluid flow resistance into a switched source of current to the said temperature detecting comparators and described circuitry, said indicating signal means comprising said temperature detecting comparators and circuitry, which communicates an imbalance of the sampled fluid temperature occuring during active fluid flow and in relationship to a predetermined temperature range, said indicating signal device indicating one or more particular corrective actions to achieve a proper fluid temperature range by manual adjustment of fluid control valves as directed by indicator elements at control handles.

4,241,869

FURNACE FUEL OPTIMIZER

John R. Cratin, Jr., Galveston, Tex., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 11, 1979, Ser. No. 2,534
Int. Cl.[3] F22G 5/00
U.S. Cl. 236—15 BR **16 Claims**

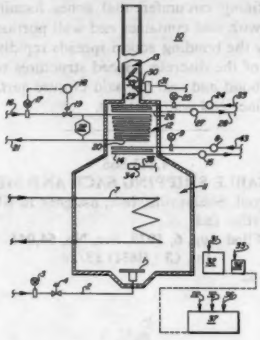
1. An improved furnace fuel optimizer for more effectively controlling fuel consumption in a furnace comprising a radiant section and a convective section containing a steam generation coil by regulating the supply of combustion air to said furnace, wherein the improvement comprises:

(a) a CO analyzer which monitors CO content in exiting flue gas;

(b) a draft pressure transmitter connected to a draft pressure controller which monitors draft below said convective section;

(c) a combustion air controller responsive to a computed optimum differential pressure value for regulating air to said furnace;

(d) a flow transmitter connected to a flow controller which



is connected to an automatic control valve, all being positioned on an inlet line to said steam generation coil;

(e) a differential pressure transmitter connected across said steam generation coil inlet and outlet lines so as to monitor variations in differential pressure across said lines;

(f) computing means for computing said optimum differential pressure value for operation of the furnace;

(g) transmission means for transmitting signals from said CO analyzer and from said differential pressure transmitter to said computing means; and

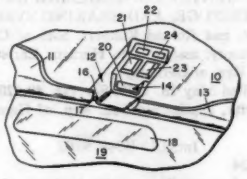
(h) means for transmitting said optimum differential pressure value to said combustion air controller.

4,241,870

REMOTE TRANSMITTER AND HOUSING

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Oct. 23, 1978, Ser. No. 953,911
Int. Cl.[3] B60R 5/00
U.S. Cl. 296—37.7 **20 Claims**



13. A housing adapted to be mounted to the headliner of a vehicle for receiving a remote control transmitter comprising:

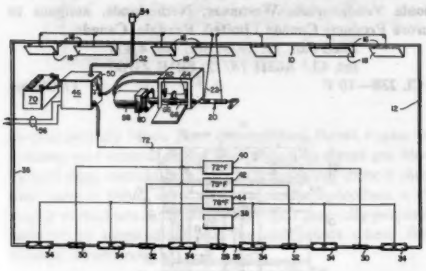
housing means having an aperture and guide and support means positioned in said housing in relation to said aperture for permitting the vehicle user to readily insert or remove an electronic transmitter therein, said housing means including means for attaching said housing to the headliner of a vehicle between the visors, said housing

further including means for supplying electrical power to a transmitter unit.

4,241,871
APPARATUS AND METHOD FOR VENTILATION OF ANIMAL ENCLOSURES

Alfred T. Newell, III, 324 Redwood St., Birmingham, Ala. 35210, and Alfred T. Newell, Jr., 3809-12 Court St., Birmingham, Ala. 35222

Filed Nov. 27, 1978, Ser. No. 964,053
Int. Cl.³ B64D *13/00*; F24F *7/00*
U.S. Cl. 236—49 **18 Claims**



1. In an animal enclosure of the differential-pressure forced-ventilation type the walls of which are substantially closed except for a plurality of inlet apertures therein for the ingress of ventilating air and a plurality of exhaust apertures therein for the egress of ventilating air, such enclosure having an electrically driven exhaust fan at each such exhaust aperture, a plurality of electrical thermostats set to operate at respective selectable temperatures within a range of temperatures through which such enclosure is expected to operate and each controlling at least one such exhaust fan, and closure means for each such inlet aperture variably positionable with respect thereto so as to control the effective size thereof, a ventilation control system comprising:

means for comparing the barometric pressure within such enclosure with that outside such enclosure,

electromechanical drive means responsive to the output of said pressure-comparing means and mechanically connected to such closure means to move the latter in the aperture-opening direction in response to a sensed pressure differential in excess of a preselected amplitude and to move such closure means in the aperture-closing direction in response to a sensed pressure differential less than a preselected amplitude, and

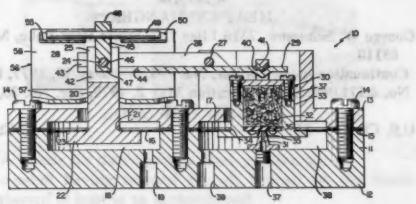
means responsive to the actuation of that one of such thermostats which is set to be operated at the highest selected temperature in such operating temperature range to operate said electromechanical drive means in the aperture-opening direction irrespective to the nature of the output of said pressure-comparing means.

4,241,872
PNEUMATICALLY OPERATED THERMOSTAT CONSTRUCTION AND METHOD OF MAKING THE SAME

Alfred A. Frankenberg, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 2, 1979, Ser. No. 54,012
Int. Cl.³ G05D *23/08*
U.S. Cl. 236—87 **22 Claims**

1. In a thermostat construction having valve means for directing a pneumatic signal to a pneumatically operated control device in relation to the force differential between the temperature sensed by a temperature sensing means thereof and the temperature setting of a temperature setting means thereof, said construction having a lever pivotally mounted thereto and being operatively interconnected to said valve means at a first portion means of said lever and to said temperature setting means and said temperature sensing means at a second portion means of said lever by a post-like member, said post-like member having a pivot means pivotally interconnected to said lever at said second portion means thereof to operatively interconnect said temperature setting means and said temperature sensing means to said second portion means of said lever, said temperature sensing means comprising a bimetal member carried by said construction, said bimetal

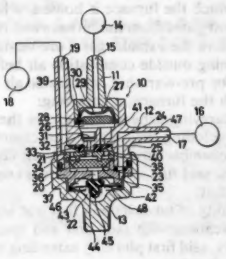


member being operatively interconnected to said post-like member by interconnection means whereby said bimetal member is operatively interconnected thereby to said second portion means of said lever, the improvement wherein said interconnection means comprises a link having a pivot means pivotally mounted to said post-like member and having a pin means, said bimetal member bearing against said pin means to pivotally interconnect said bimetal member to said link and, thus, to said post-like member.

4,241,873
TEMPERATURE RESPONSIVE VALVE DEVICE

Atsushi Satomoto, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 28, 1979, Ser. No. 70,527
Claims priority, application Japan, Sep. 13, 1978, 53-125842[U]
Int. Cl.³ G05D *23/08*
U.S. Cl. 236—87 **7 Claims**



1. A temperature responsive valve device comprising:

a body having first, second and third ports;

first passage means disposed between said first and second ports;

second passage means disposed between said second and third ports;

means defining an orifice arranged within said first passage means for delaying transmission of fluid therethrough;

a first filter member arranged between said orifice means and said first port and within said first passage means;

a second filter member arranged within said first and second passage means and between said orifice means and said second port as well as between said second and third ports;

a passage defining member having an annular portion which

contacts with said second filter member to thereby allow fluid communication between an inner portion of said annular portion with said first port and communication of an outer portion of said annular portion with said third port only through means of said second filter member; and

a temperature responsive valve member for interrupting communication of said third port with said second port in response to change in temperature.

4,241,874

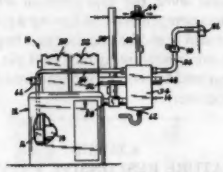
HEAT EXCHANGER

George W. Schossow, 2316 Lilac La., White Bear Lake, Minn. 55110

Continuation-in-part of Ser. No. 798,567, May 19, 1977, Pat. No. 4,171,089. This application May 2, 1979, Ser. No. 35,325

Int. Cl.[3] F24B *7/04*

U.S. Cl. 237—55 18 Claims



8. In combination with a furnace system wherein the furnace includes a burner which draws combustion air from outside the building in which the furnace is housed, a heat exchanger for cooling exhaust gases from the furnace and removing moisture therefrom before the exhaust gases are vented from the building, for warming outside combustion air before it reaches the burner, and for pre-warming cool inside air before recirculating it through the furnace, comprising:

a conduit carrying exhaust gases from the furnace;

a housing including first and second chambers and an intermediate chamber positioned between said first and second chambers, said first chamber in fluid communication with said conduit;

a first plurality of tubes having first and second ends in fluid communication with said first and second chambers respectively, said first plurality extending through said intermediate chamber;

a first outlet plenum enclosing a first portion of said conduit;

a second outlet plenum enclosing a second portion of said conduit;

an inlet plenum;

means for conducting outside air for combustion into said inlet plenum;

a second plurality of tubes extending through said intermediate chamber, said tubes having first ends in fluid communication with said inlet plenum and second ends in fluid communication with said first outlet plenum;

a third plurality of tubes extending through said intermediate chamber, said third plurality having first ends in fluid communication with ambient air inside the building in which the furnace is located and second ends in fluid communication with said second outlet plenum;

liquid medium disposed in said intermediate chamber, said medium surrounding portion of said first, second, and third pluralities of tubes extending through said intermediate chamber;

means for conveying combustion air in said first outlet plenum to the furnace burner;

means for transmitting ambient air in said second outlet plenum to the return air blower of the furnace; and

means for draining moisture of condensation from said first plurality of tubes.

4,241,875

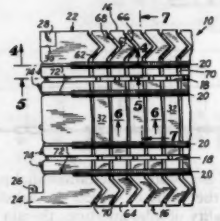
FLEXIBLE TRACK

Anthonie Vandenbrink, Westmaas, Netherlands, assignor to Aurora Products Canada Limited, Rexdale, Canada

Filed Jan. 19, 1979, Ser. No. 4,800

Int. Cl.[3] A63H *18/12;* E01B *23/00*

U.S. Cl. 238—10 F 17 Claims



1. A flexible track for wheeled toy vehicles having at least one pair of laterally spaced wheels including a plurality of separate track sections extending laterally of said track and each having a top surface defining a path for said toy vehicles; and coupling means pivotably coupling adjacent track sections, said coupling means permitting at least relative pivotal displacement of adjacent track sections about an axis of pivoting extending substantially normally to the track top surface, each of said track sections being formed with portions facing the adjacent track section shaped so as to define a gap therebetween extending between said coupling means and a lateral periphery of said track when said track is aligned in a substantially straight configuration when viewed longitudinally, the top surfaces of said portions of said track sections being shaped to define an essentially tapered gap extending from the lateral periphery of said track to at least the region of said coupling means, said gap being widest at said lateral periphery, the path of a toy vehicle on said top surfaces of said track section being aligned so that at least the one wheel of said pair of laterally spaced wheels farthest from the lateral periphery of the track would normally travel in the region of the top surfaces in registration with the relatively narrower portions of said gap whereby interaction between said at least one wheel of each of said toy vehicles and said gap as might cause vibration and reduction in the speed of the vehicles is minimized.

4,241,876

VARIABLE AREA EXHAUST NOZZLE

George H. Pedersen, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

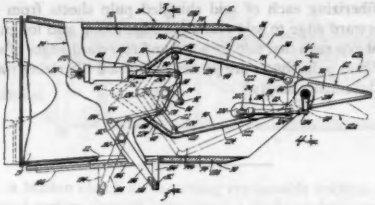
Filed Mar. 22, 1979, Ser. No. 22,706

Int. Cl.[2] B64C *15/06*

U.S. Cl. 239—265.27 3 Claims

1. A two dimensional gas turbine engine nozzle assembly comprising an ovate inlet and a rectangular exhaust outlet, spaced parallel side walls, an upper wall portion and a lower wall portion defining a minimum height throat region between said inlet and outlet, an expandable plug assembly located within said throat region including flow control means for varying the area of exhaust flow through the throat region for

optimizing modulation of axial nozzle thrust produced by flow from said outlet, a vertical thrust door means located on one of said upper or lower walls of said exhaust nozzle upstream of said expandable plug assembly and being selectively movable between open and closed positions, actuator means coupled to said flow control means and to said vertical thrust door means



to concurrently block flow through said throat region while opening said vertical thrust door means to direct gas blocked by said plug assembly from a point upstream thereof through said vertical thrust door means thereby to produce a thrust vector on said nozzle assembly arranged generally perpendicularly to its longitudinal axis during periods where flow is blocked therethrough.

4,241,877

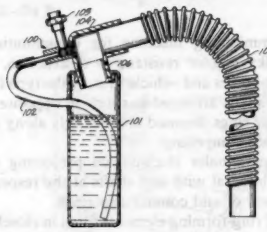
STABLE VORTEX GENERATING DEVICE

Nathaniel Hughes, Palm Springs, Calif., assignor to Hughes Sciences Group, Inc., Palm Springs, Calif.

Continuation-in-part of Ser. No. 886,289, Mar. 13, 1978, Pat. No. 4,189,101, which is a continuation-in-part of Ser. No. 785,838, Apr. 10, 1977, Pat. No. 4,109,862. This application Oct. 16, 1978, Ser. No. 951,621

Int. Cl.³ B05B *17/06*

U.S. Cl. 239—405 **55 Claims**



1. A vortex generating device comprising:

a flow passage having a cylindrical upstream section, a cylindrical downstream section, and a cylindrical intermediate section interconnected together and aligned with a flow axis, the downstream section forming an outlet restriction in the flow passage, the cross-sectional area of the intermediate section being substantially larger than that of the downstream section, and the cross section of the upstream section being larger than that of the intermediate section;

a rod aligned with the flow axis, the rod extending completely through the upstream section and through only part of the intermediate section; and

an inlet opening into the upstream section, the inlet opening being aligned with an inlet axis at an angle to the flow axis.

4,241,878

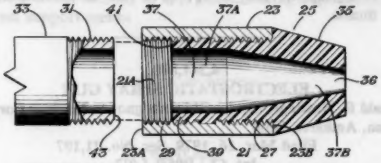
NOZZLE AND PROCESS

Gene E. Underwood, Casper, Wyo., assignor to 3U Partners, Casper, Wyo.

Filed Feb. 26, 1979, Ser. No. 15,292

Int. Cl.³ B05B *1/06*

U.S. Cl. 239—591 **26 Claims**



8. A nozzle for discharging a fluid, comprising:

a conduit having internal threads formed on the inside thereof at least at an upstream end,

an elastic member molded in said conduit,

said conduit having locking means formed on the inside thereof at a position downstream of said threads for locking said elastic member to said conduit,

said elastic member extending from the down stream end of said conduit to an upstream position spaced inward from said upstream end of said conduit embedding said locking means and at least a portion of said threads leaving the remaining portion of said threads exposed to allow said upstream end of said conduit to be threaded to mating external threads of a second conduit,

said elastic member having an opening formed therethrough from said upstream position to a discharge end for the discharge of fluid,

the cross-sectional area of said aperture at said discharge end being smaller than the cross-sectional area of said aperture at said upstream end.

4,241,879

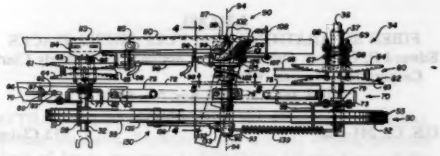
DRIVE SYSTEM FOR A MANURE SPREADER

William F. Ostergren, Terre Hill, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 2, 1979, Ser. No. 8,900

Int. Cl.³ A01C *19/00*; F16H *7/08, 55/54*

U.S. Cl. 239—677 **24 Claims**



1. In a manure spreader having a mobile frame, a spreader box mounted on the frame with a floor, opposing sides, a forward endwall and a rear discharge opening, a material discharge means mounted on the spreader box adjacent the discharge opening for the widespread discharge and distribution of the material from the box, material conveying means at least partly within the spreader box for moving material in the box toward the material discharge means, and drive means for receiving rotational power input and transferring same to the material discharge means and material conveying means, the improvement wherein said drive means comprises:

an input drive shaft rotatably supported on said frame adapted to receive rotational power from a prime mover;

first drive means operably interconnecting said input drive shaft and said material discharge means;

second drive means operably interconnecting said input drive shaft and said material conveying means; and

control means supported on said frame and operably connected to said first and second drive means to selectively infinitely vary the speed of operation of said material conveying means over a predetermined range of speeds from a first slow speed to a second high speed without changing the rate of speed of said material discharge means.

4,241,880

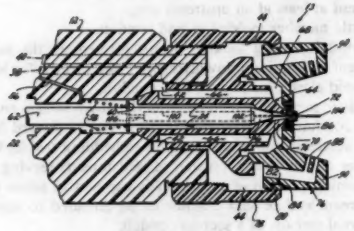
ELECTROSTATIC SPRAY GUN

Donald R. Hastings, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Mar. 16, 1979, Ser. No. 21,197

Int. Cl.³ B05B 5/02

U.S. Cl. 239—691 **11 Claims**



1. An electrostatic coating apparatus comprising:

a nozzle made from a substantially nonconductive material having a coating material passageway in it terminating at one end in a material discharge orifice through which coating material is ejected,

a charging electrode protruding from said nozzle orifice,

a needle and seat valve in said nozzle passageway operative to selectively open and close said nozzle orifice,

a high voltage electrical path passing through said valve adapted to connect said charging electrode to a source of high voltage electrical power, and

a least a first series resistor in said needle in said electrical path.

4,241,881

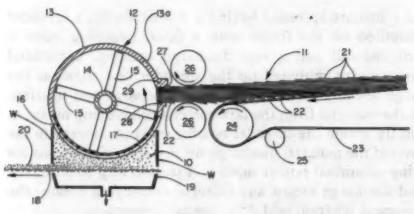
FIBER SEPARATION FROM PULP SHEET STACKS

Edward P. Laumer, Oshkosh, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 12, 1979, Ser. No. 56,827

Int. Cl.³ B02C 13/286

U.S. Cl. 241—28 **13 Claims**



1. A method for separating fibers from a stack of planar pulp sheets, each of said pulp sheets being defined by forward and rearward edges and opposed lateral side edges, and defining a longitudinal axis aligned perpendicular to said forward and rearward edges, comprising:

(a) feeding said stack of pulp sheets edgewise in shingled relation to a hammermill-type fiberizing means,

(b) aligning said pulp sheets to said fiberizing means such that said longitudinal axes of said pulp sheets are aligned generally radially to said rotating fiberizing means,

(c) fiberizing each of said shingled pulp sheets from said forward edge to said rearward edge along said longitudinal axis such that said forward and rearward edges of each of said pulp sheets are presented to said fiberizing means substantially singly.

4,241,882

COMMINUTING MACHINE

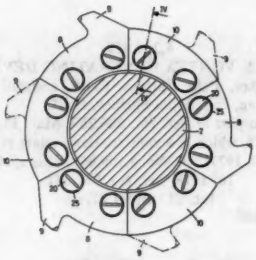
Eugene M. A. Baikoff, ch. Anciens Moulins 2A, 1009 Pully (Canton of Vaud), Switzerland

Filed Jun. 13, 1979, Ser. No. 48,239

Claims priority, application Switzerland, Jun. 20, 1978, 6701/78

Int. Cl.³ B02C 18/18

U.S. Cl. 241—236 **8 Claims**



1. In a comminuting machine for comminuting objects which are bulky and/or resistant to destruction, especially parts of vehicle bodies and vehicle tires, of the type having two parallel rotary shafts arranged to rotate in opposite directions and comminutor rings disposed alternatingly along said shafts, the improvement comprising:

a plurality of annular shaft-collars projecting outwardly from and integral with said shafts at the respective locations of each of said comminutor rings,

a plurality of ring-forming elements fitted in closely adjacent relation to one another over associated said shaft-collars to form said comminutor rings, each of said elements having a cross-sectional profile in the shape of an open-ended inverted U comprising two sidewalls which are situated respectively one on each side of an associated shaft-collar, each of said shaft-collars extending continuously through the open ends of said inverted U cross-sectional profiles from one to the next adjacent one of the elements on said shaft-collar, at least some of said elements including cutter-noses, and

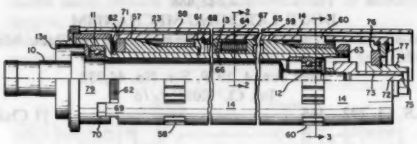
a plurality of securing members passing through said sidewalls and through said shaft-collars for securing each of said elements to said associated shaft-collars and hence to said shafts, whereby the axial pressure of said sidewalls against said shaft-collars ensures the resistance of said comminutor rings formed of said elements to axial mechanical stresses.

4,241,883

MANUALLY OPERATED BOBBIN CHUCK

Joshua Benin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 24, 1979, Ser. No. 69,751
Int. Cl.[3] B65H *54/54, 75/30*
U.S. Cl. 242—46.4 1 Claim



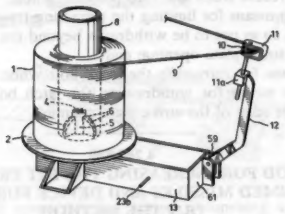
1. A bobbin chuck for mounting replaceable bobbins on the external surface thereof comprising: a shaft; a tubular member mounted for rotation on said shaft and concentric therewith; a sleeve having a plurality of openings disposed in a concentric relationship about said tubular member, said sleeve being movable axially with respect to said tubular member and rotatable therewith; a plurality of camming members carried by said tubular member and supporting said sleeve in said concentric relationship, said camming members having tapered camming surfaces; a plurality of radially and axially movable cam followers having mating surfaces engageable with the camming surfaces and extending through the openings in the sleeve for gripping bobbins on said chuck; resilient means seated against said tubular member and said sleeve for urging said sleeve axially in one direction to urge the mating surfaces of said cam followers against said tapered camming surfaces of said camming members to move said cam followers into a gripping position; and means located at the end of the chuck for moving the sleeve and the cam followers axially in a direction opposite to said one direction to a release position.

4,241,884

POWERED DEVICE FOR CONTROLLING THE ROTATION OF A REEL

George Lynch, 546 Hull Ct., Burlington, Ontario, Canada

Filed Mar. 20, 1979, Ser. No. 22,333
Int. Cl.[3] B65H *49/00*
U.S. Cl. 242—54 R 9 Claims



1. A device for controlling the rotation of a reel to control the tension on a filamentary material being unwound therefrom, comprising:

(a) a rotatable reel support means,

(b) means for sensing tension on the filamentary material,

(c) valve means responsive to said tension sensing means,

(d) a powered device including a reciprocatable element controlled by said valve means in accordance with the tension on said filamentary material to move to a first position in response to low tension, to reciprocate in response to high tension, and to move to a second position in response to an intermediate tension, and

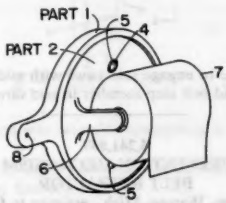
(e) a clutch operable by the reciprocatable element, the clutch being engageable with the rotatable reel support means in response to movement of the reciprocatable element to said first position, thereby to brake said reel support means, the clutch being disengageable from the reel support means in response to movement of the reciprocatable element to said second position, thereby to allow free rotation of the reel support means, and the clutch being intermittently engageable with the reel support means in response to reciprocation of the reciprocatable element thereby to apply accelerating impulses to the reel support means.

4,241,885

REVERSIBLE TOILET PAPER HOLDER

Gene P. Robinson, 4661 Larson Way, Sacramento, Calif. 95822

Filed May 2, 1979, Ser. No. 35,326
Int. Cl.[3] B65H *19/02*
U.S. Cl. 242—55.2 6 Claims



1. A rotatable dispenser suitable for wall or other surface mounting for holding a roller and toilet paper or other rolled material comprising, a latching member adapted to be fixed to said wall or other surface mounting, a turntable, said turntable having two spaced supporting arms for receiving the roller for the rolled material for rotation about the axis of the roller, means for rotatably supporting said turntable on said latching member for free rotation about an axis perpendicular to the axis of said roller, latch means on said latching member for holding said turntable in a desired dispensing position relative to said latching member and retaining means for holding said latching member and said turntable in assembled position.

4,241,886

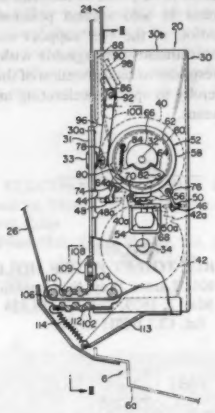
RETRACTOR DEVICE FOR SEAT BELT MECHANISM

Naozane Maekawa, Toyokawa, and Takeshi Awano, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1979, Ser. No. 70,988
Claims priority, application Japan, Sep. 8, 1978, 53/124248[U]
Int. Cl.[3] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.2 6 Claims

1. A retractor device for a seat belt mechanism, comprising a casing, a reel shaft for reeling a seat belt being rotatably supported by said casing, a ratchet wheel fixedly mounted on said reel shaft, a pawl supported by said casing and adapted to engage with said ratchet wheel, an abutment surface provided on said casing along a passage provided for said belt, a belt stop member disposed opposite to said abutment surface with respect to said belt, guide slots formed in said casing for guiding said belt stop member toward said abutment surface to clamp said belt between them when the belt stop member is moved in

a direction corresponding to drawing out of the belt, and emergency operating means sensible to an emergency condition of a vehicle to engage said pawl with said ratchet wheel and to move said belt stop member in said direction.

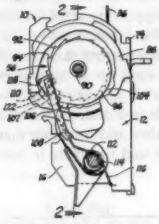


4,241,887

WINDING PREVENTION MECHANISM FOR SEAT BELT RETRACTOR

Algis G. Augunas, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1979, Ser. No. 77,843
Int. Cl.³ A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.7 **2 Claims**



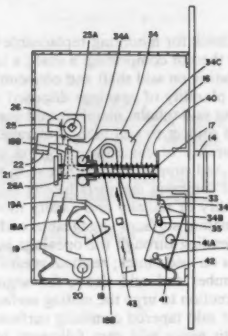
1. In combination, a belt for restraining an occupant, a housing, a reel, a spring urging reel winding to wind the belt, a ratchet carried by the reel, a pawl, means acting between the pawl and housing for mounting the pawl on the housing for radial movement between ratchet engaging and disengaging positions and for tangential shifting movement between limits in the winding and unwinding directions, said mounting means including blocking means blocking radial pawl movement to the engaging position when the pawl is at the unwinding limit, a disc clutched to the reel for rotation therewith and having an abutment adapted to engage with and effect tangential shifting movement of the pawl in the winding direction upon belt winding and in the unwinding direction upon belt unwinding, said disc having a control surface effective to control radial movement of the pawl, said control surface being adapted to permit engagement of the pawl with the ratchet upon belt unwinding subsequent to a prior winding rotation having shifted the pawl to the winding limit to unblock the pawl for movement to the engaged position so that the belt is held at a set slackened length with respect to an occupant, said disc control surface being further adapted to disengage the pawl from the ratchet upon further belt unwinding approaching engagement of the control disc abutment with the pawl to shift the pawl in the unwinding direction upon engagement by the abutment and reestablish blocking of the pawl in the disengaged position by the blocking means during subsequent belt winding and unwinding to restore the winding effort of the spring.

4,241,888

DOOR LATCHING MECHANISM

Leonard N. Bredemus, 661 E. Belmont La., St. Paul, Minn. 55117

Filed Jun. 4, 1979, Ser. No. 44,852
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—165 **11 Claims**



1. Door latching apparatus for operating a normally single swing door as a double swing door, comprising, in combination:

a. a strike plate mounted on the doorway frame having an opening coextensive with a latching recess in the doorway frame, one edge of the strike plate opening being offset from the other edge;

b. a latch bolt slidably mounted within the door normally being extendibly urged to seat in the latching recess;

c. a retractor lever arm coupled to a turn piece and engaging said latch bolt for retracting the latch bolt from the latching recess when said turn piece is turned;

d. stop means for limiting the retracting travel of the latch bolt so as not to be withdrawn beyond the other edge of the strike plate opening; and

e. means for retracting the latch bolt while avoiding said stop means for withdrawing the latch bolt beyond the other edge of the strike plate opening.

4,241,889

METHOD FOR INCREASING THE HIT PROBABILITY OF JAMMED MISSILES AND DEVICE FOR CARRYING OUT THE METHOD

Ulrich Schwellinger, Heroz-Siegmund-Weg, Zorneding, and Rüdiger Lenz, Holzkirchen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,795
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738507
Int. Cl.³ F41G *7/00*; F42B *15/02*; G06F *15/50*
U.S. Cl. 244—3.15 **9 Claims**

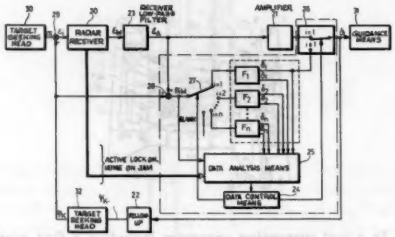
1. A method for increasing the hit probability of missiles which are subject to being jammed by double or multiple targets and which missiles are guided by means of proportional navigation and have a target-seeking head capable of following up comprising the steps of:

assigning measured values σ_{iM} of a first target recognized by the target-seeking head of the missile to a first filter, F_1,

for target track formation as well as for guidance and target-seeking head follow-up;

separating the first filter from the measured values σ_{iM} of the target-seeking head if the measured values result in a determination that there is movement of the line of sight of the missile, which measured values must have been caused by a target maneuver which is outside of predetermined limits because of the maneuverability of airborne targets;

continuing to form by extrapolation in said first filter the probable target track after said filter has been separated



and influencing the guidance of said missile and target-seeking head with said probable target track;

supplying, after separation of said first filter, measured values of target track information from a second target to a second filter F_2;

separating the second filter and again providing the first filter with measured values by the target-seeking head when the measured values are recognized to belong to the target track processed by the first filter; and

recognizing measured values belonging to no target track and not processing such measured values.

4,241,890

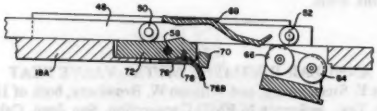
AERIAL DELIVERY SYSTEM

Raymond E. Pearson, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 961,359, Nov. 16, 1978, abandoned. This application Nov. 7, 1979, Ser. No. 92,146

Int. Cl.³ B64D *9/00*

U.S. Cl. 244—137 R **14 Claims**



1. An aerial cargo delivery system comprising a pair of parallel guide rails for cargo-carrying pallets extending longitudinally along the floor of an aircraft which has a rear cargo receiving and delivery opening, a single one of said rails at spaced points therealong being provided with pallet locking mechanisms each of which is provided with means for releasably engaging a pallet to hold it in position along the guide rails, and cam means for each of said locking mechanisms simultaneously movable along said single rail, said cam means having a first position where said engaging means will release said pallet for movement aft of the aircraft but not forward of the aircraft, a second position where said engaging means will prevent either forward or aft movement of a pallet and a third position where the engaging means will prevent forward movement of a pallet but will permit aft movement of the pallet by movement of said engaging means into a release position against the restraining force of a deformable metallic fuse.

4,241,891

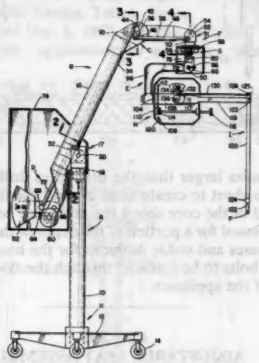
OVERHEAD ARM ASSEMBLY

Dale C. Rudolph, Parker, Colo., assignor to Unirad Corporation, Englewood, Colo.

Division of Ser. No. 907,408, May 18, 1978. This application Apr. 6, 1979, Ser. No. 27,865

Int. Cl.³ F16L *3/00*; A47G *29/00*

U.S. Cl. 248—123.1 **8 Claims**



1. An overhead arm assembly comprising in combination:

a. a base;

b. a first arm pivotally mounted adjacent one end thereof to said base by first pivot means;

c. a second arm pivotally mounted at one end thereof to the other end of said first arm by second pivot means;

d. a third arm having one end pivotally connected to said second arm adjacent the other end thereof and adapted to support depending equipment from adjacent the other end thereof;

e. a dynamic counterbalancing assembly comprising:

i. a lever pivotally connected at one end to said first arm adjacent said first arm one end by third pivot means;

ii. means for connecting said second arm to said lever for constraining them to a substantially parallel relationship with each other; and

iii. biasing means connected adjacent the other end of said lever for applying a first counterbalancing force to said first arm about said third pivot means, said counterbalancing force varying in response to the angular orientation of said second arm relative to said base, the moment of inertia of said dynamic counterbalancing assembly about said third pivot means being approximately equal to the moment of inertia of said second arm, third arm, and said depending equipment about said second pivot means; and

f. a static counterbalancing means for applying a second counterbalancing force to said first arm, said second counterbalancing force approximately balancing said first arm about said first pivot means, said static counterbalancing means being connected with said first arm adjacent said first arm one end.

4,241,892

APPLIANCE SKIDBOARD AND METHOD OF MAKING

Ivan B. Morris, Louisville, Ky., assignor to Boone Box Co., Louisville, Ky.

Filed Aug. 31, 1979, Ser. No. 71,139

Int. Cl.³ B65D *19/00*

U.S. Cl. 248—346 **5 Claims**

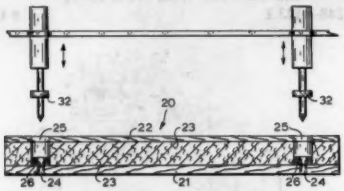
1. A skidboard to be affixed to and support an appliance comprising:

a core of built-up glued corrugated board of uniform thick-

ness with the flutes running normal to the top and bottom of the core;

top and bottom facing sheets affixed to the top and bottom edges of the core;

first holes drilled through the said sheets and core to receive bolts to affix the skidboard to the base of the appliance;



second holes larger than the first holes drilled through the bottom sheet to create areas around the first holes;

the board of the core above the said areas being matted and compressed for a portion of the depth of the core to create solid bases and stable cushions for the heads and washers of the bolts to be screwed through the skidboard into the base of the appliance.

4,241,893

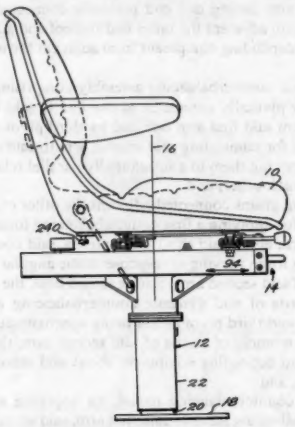
ADJUSTABLE SEAT ASSEMBLY

Louis J. Koutsky, Milan, and Alexander M. Breitmeyer, Taylor Ridge, both of Ill., assignors to Sears Manufacturing Co., Davenport, Iowa

Filed May 11, 1979, Ser. No. 38,317

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—425 **19 Claims**



1. In an adjustable seat assembly:

a seat;

a pedestal having a vertical axis for vertically supporting the seat from below;

adjustment means cooperating with said pedestal and with said seat for slidably adjusting said seat in fore-and-aft and lateral side-to-side directions relative to the pedestal axis, said adjustment means carrying said seat and being mounted to said pedestal for rotation relative thereto in a horizontal plane;

latch means for selectively preventing and permitting rotation of said adjustment means relative to said pedestal;

latch release means, responsive to the arrival of said seat at a predetermined aft position and predetermined lateral position, for releasing said latch means; and

guide means for guiding said seat toward said predetermined lateral position as said seat moves toward said predetermined aft position.

4,241,894

SEAT SUSPENSION APPARATUS

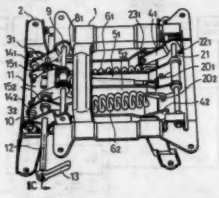
Teiji Okuyama, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 3, 1979, Ser. No. 26,706

Claims priority, application Japan, Apr. 15, 1978, 53-44433; Apr. 15, 1978, 53-44434

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—576 **4 Claims**



1. In a seat suspension apparatus including a first parallel motion assembly, a spring urging said assembly in a given direction, and means for adjusting the resilience of said spring which causes said assembly to move in a given direction, the improvement comprising a second parallel motion assembly having a common lower frame member with said first parallel motion assembly and which is offset at an angle with respect to said first parallel motion assembly, said first parallel motion assembly comprising a pair of spaced apart opposed link arms each having three pivot points which are located on the apices of the triangle, a lower frame member adapted to be secured to a floor, means pivotably connecting first pivot points on each link arm to opposite ends of said lower frame member, an upper frame member adapted to have a seat secured thereto, means pivotably connecting second pivot points on each of said link arms to opposite ends of said upper frame member, said second parallel motion assembly comprising said link arms, said lower frame member, a connecting link extending between said link arms and means pivotably connecting the ends of said connecting link to third pivot points on said link arms, said link arms being pivoted about said first pivot points substantially equal distances on opposite sides of a horizontal line extending through said first and second pivot points on said link arms.

4,241,895

ANNULAR RESILIENT METAL VALVE SEAT

James E. Sternenberg, and William W. Broadway, both of Houston, Tex., assignors to FMC Corporation, San Jose, Calif.

Filed Apr. 26, 1978, Ser. No. 899,930

Int. Cl.³ F16K *1/22*

U.S. Cl. 251—173 **7 Claims**

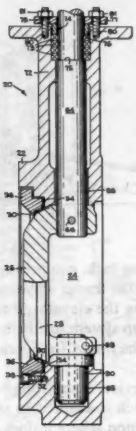
1. A valve comprising, in combination, a generally annular valve body defining a flow passage;

a fluid flow control element movably supported in the flow passage for controlling the flow of fluids through the valve;

an annular resilient metal seal having a planar portion and a curved lip portion, said lip portion having a shallow arcuate configuration and extending generally laterally from said planar portion entirely to one side of the plane defined thereby with the free edge of said lip portion defining the laterally outermost extent of said lip portion spaced from said planar portion, said seal being positioned in the flow passage where said lip portion cooperates with the flow control element to establish a fluid flow barrier through said passage;

a retainer ring having a planar portion and a frusto-conical portion, said retainer ring being positioned in the flow passage such that said planar portion of said seal is gripped in a fluid-tight relationship between said planar portion of said retainer ring and said frusto-conical portion is in normally spaced relation to said seal lip portion, whereby portions of said valve body operate said seal in a cantilever mode as said flow control element moves against said seal, said frusto-conical portion of said retainer ring supporting the free edge of said lip portion of said metal seal when said control element presses against said lip portion of said metal seal to operate said seal in a structural span mode when said passage is closed; and

means for releasably securing said retainer ring in position against said metal seal.



4,241,896

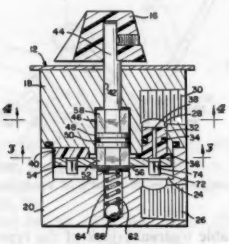
METHOD OF MAKING CALIBRATED GAS METERING ORIFICE AND PRODUCT THEREOF

Clayton B. Voege, Indianapolis, Ind., assignor to Ray V. Bussell, Indianapolis, Ind.

Filed Jan. 22, 1979, Ser. No. 5,518

Int. Cl.³ F16K *3/32, 51/00*

U.S. Cl. 251—206 **12 Claims**



1. A calibrated gas metering valve, comprising

a valve body having a gas inlet and a gas outlet and a dividing wall formed with a hole therein defining a passage for gas flow from the inlet to the outlet,

a plug press-fitted in the hole so as to be solely positioned therein by the fitting engagement of its peripheral surface with the wall of the hole,

one of the interface surfaces between the plug and the wall of the hole having therein a groove or the like of progressively decreasing cross section so as to define therebetween an opening of a size that depends on the depth to which the plug is inserted in the hole,

the plug being positioned in the hole at a determined depth which produces an opening size giving a desired flow rate.

4,241,897

BUTTERFLY VALVE

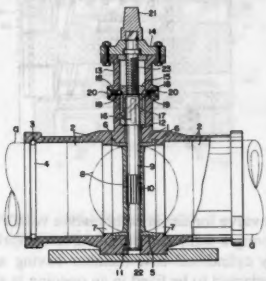
Keiji Maezawa, Tokyo, Japan, assignor to Maezawa Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1978, Ser. No. 967,686

Claims priority, application Japan, Dec. 17, 1977, 52-169746[U]

Int. Cl.³ F16K *31/50, 31/528*

U.S. Cl. 251—229 **2 Claims**



1. A butterfly valve particularly suitable for connection with synthetic resin pipes and for underground installations, said butterfly valve being characterized by:

A. a body of synthetic plastic having

(1) a main portion defining

(a) a central annular valve casing and

(b) a pair of tubular mouthpieces that are coaxial with said valve casing and project in opposite axial directions therefrom, and

(2) a cylindrical chamber portion projecting laterally from said valve casing at one side thereof, said chamber portion having its axis normal to that of said main portion;

B. a metal driven shaft extending diametrally across said valve casing coaxially with said chamber portion and having an end portion projecting into said chamber portion, said driven shaft being rotatably journaled in coaxial bearings in the wall of said valve casing;

C. a cylindrical actuating member axially slidably and rotatably confined in said chamber portion, said actuating member

(1) having a helix connection with said chamber portion whereby axial motion of said actuating member is accompanied by rotation thereof, and

(2) surrounding said end portion of the driven shaft and having a splined connection therewith whereby the actuating member is axially movable relative to said shaft but said shaft is constrained to rotate with the actuating member;

D. a drive shaft journaled in an outer portion of said chamber, said drive shaft

(1) being coaxial with the driven shaft,

(2) being confined to rotation relative to said body,

(3) having an outer end portion that is accessible at the exterior of said chamber for rotational actuation and

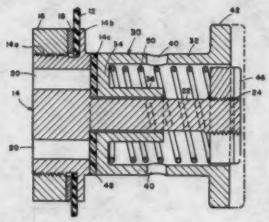
(4) having an inner end portion in said chamber that is surrounded by said actuating member and has a threaded connection therewith whereby rotation of the drive shaft imparts axial motion to the actuating member; and

E. a disc-like valve element secured to said driven shaft to be turned flatwise between open and closed positions by rotation of the driven shaft.

4,241,898
PURGE VALVE FOR DIVER'S MASK

Steven F. Segrest, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 8, 1979, Ser. No. 1,505
Int. Cl.³ F16K 15/18
U.S. Cl. 251—321 3 Claims



1. A purge valve for use in combination with a diving mask or helmet having a wall, said purge valve comprising:

a generally cylindrical base member having an inner end portion adapted to be fixed in an opening in said wall and an outer end portion extending outwardly of said wall and presenting a plane, annular valve seat surface, said base member having a plurality of passages extending axially therethrough and opening in said valve seat surface;

a stem of predetermined length having its long axis normal to said valve seat surface and extending outwardly from said base member;

a valve member slidably mounted on said stem and having a cylindrical outer wall having an outside diameter substantially equal to the diameter of said valve seat surface and an axial length substantially equal to said predetermined length, an annular end wall normal to the central axis of said cylindrical outer wall, and a cylindrical inner wall reentrant from said end wall and in coaxial spaced relation within said cylindrical outer wall, said cylindrical inner wall being shorter than said cylindrical outer wall and surrounding said stem with said annular end wall in juxtaposition with said valve seat surface;

retainer means mounted on the outer end of said stem, said retainer means being engageable by the outer end of said cylindrical inner wall to limit movement of said valve member away from said valve seat surface;

a compression spring nested within said valve member between said inner and outer cylindrical walls and acting between said retainer means and said annular end wall to yieldably urge said valve member along said stem toward said base member, whereby said passages are normally obturated by engagement of said end wall with said valve seat, and are opened by retraction of said valve member away from said base member;

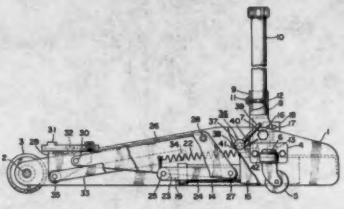
said valve member being open at the end of said cylindrical outer wall remote from said annular end wall and comprising a flange extending radially outwardly from the open end of said cylindrical outer wall for manual retraction of said valve member by a diver; and

said retainer means being at least partially recessed into and in radially spaced relation with said open end of said cylindrical outer wall of said valve member and being removable from said stem to permit ready disassembly of said valve member and spring from said base member and stem.

4,241,899
LIFTING JACK WITH LOCKING DEVICE

Kazumasa Kaneko, Fuji, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Jan. 8, 1979, Ser. No. 1,528
Claims priority, application Japan, Jan. 11, 1978, 53-1820[U]
Int. Cl.³ B66F 5/04
U.S. Cl. 254—8 B 1 Claim



1. A hydraulic lifting jack, comprising: a frame; an elevator pivotally mounted on the frame; a hydraulic cylinder mounted on the frame for lifting the elevator; a reservoir for hydraulic fluid; a hydraulic pump system for the hydraulic cylinder; and a handle, pivoted on the frame, for operating the pump system; characterized by:

a handle locking device, comprising:

a stop member which is adapted to pivot on the frame between a first position where it does not interfere with the handle, and a second position where it contacts the handle, when the handle is positioned in the upright position, at its lower end portion, so as to lock the handle;

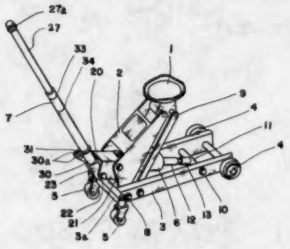
a lever for pivoting the stop member; and

a spring means which urges the lever in the direction to urge the stop member to the second position.

4,241,900
QUICK ACTING HYDRAULIC LIFTING JACK

Genzaburo Okuda, 263-banchi Tanjo Mihara-cho, Minamikawachi-gun, Osaka-Pref., Japan

Filed Aug. 24, 1979, Ser. No. 69,507
Int. Cl.³ B66F 3/24
U.S. Cl. 254—8 B 5 Claims

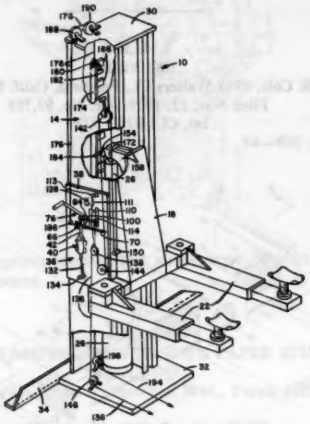


1. In a portable hydraulic jack of the type wherein a load supporting arm means is pivotally mounted on wheeled carriage means for swinging movement in a vertical plane, said carriage means including elongated vertically swingable handle means for propelling and guiding the carriage means on a floor and for incrementally raising the arm means by reciprocatory movement in a vertical plane to actuate a hydraulic pump means, the improvement which comprises force transferring means automatically actuated by swinging movement of said handle means in one direction to initially mechanically raise said arm means from a lowered position into contact with a load.

4,241,901
VEHICLE LIFT ASSEMBLY AND CONTROL SYSTEM THEREFOR

Donald F. Shircliffe, Louisville, Ky., assignor to VBM Corporation, Louisville, Ky.

Filed Nov. 7, 1977, Ser. No. 848,895
Int. Cl.[2] B66F 7/12
U.S. Cl. 254—89 H **18 Claims**



15. A control system for a pair of independently movable translating means comprising

means for sensing a change in the relative displacement of said pair away from a preferred relative displacement of said pair, and

means operatively connected to said pair and responsive to said change, for automatically restoring said pair to said preferred relative displacement, said sensing means further comprising a cable strung between said pair under a preselected amount of tension when said pair is disposed in said preferred relative displacement, said cable tension being variable as a function of said change, said restoring means being responsively connected to said cable and responsive to a variation in said tension from said preselected amount.

4,241,902
SYSTEM FOR VESSEL EXCHANGE

Howard M. Fisher, New Castle, and Rashed N. Nagati, Mars, both of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jul. 16, 1979, Ser. No. 57,759
Int. Cl.[2] C21B 13/00
U.S. Cl. 266—44 **20 Claims**

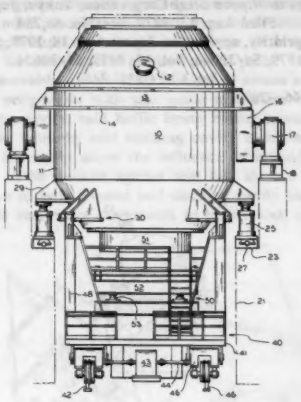
1. A metallurgical vessel handling apparatus comprising:

a metallurgical vessel;

trunnion means for partially surrounding and supporting said vessel at a first height;

lift means adjacent said vessel for engaging said vessel and vertically lifting same relative to said trunnion means to a second height;

transfer means for being movably positioned beneath said vessel when said vessel is at said second height, said transfer means including vessel support means for engaging and supporting said vessel when said vessel is at a third height intermediate said first and second heights;



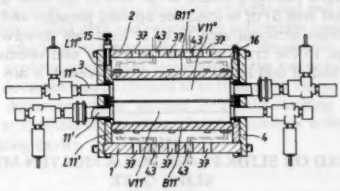
power means for said lift means; and

means for driving said transfer means.

4,241,903
APPARATUS FOR HEAT TREATING ELONGATED SHEETS

Erik R. Hellman, Vesterås, Sweden, assignor to AB Asea-Atom, Vesterås, Sweden

Filed Aug. 16, 1979, Ser. No. 66,975
Claims priority, application Sweden, Aug. 22, 1978, 7808831
Int. Cl.[3] C21D 9/52
U.S. Cl. 266—109 **8 Claims**



1. Apparatus for heat treatment of an elongated sheet comprising:

at least one elongated heating element;

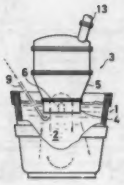
at least one pair of internally cooled rolls, positioned after said heating element in the direction of movement of an elongated sheet, for transporting a sheet past said heating element in a direction transverse to the axis of both the rolls and said heating element;

a treatment chamber having walls facing and substantially enclosing said heating element and that portion of the sheet between said heating element and said pair of rolls, said chamber having inlet and outlet gaps for the sheet as it is transported through the apparatus;

means for passing an oxidation-preventive protective gas through said treatment chamber; and

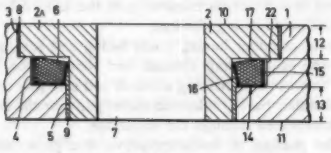
at least one pair of substantially enclosed roll pockets housing said cooled rolls, said pockets communicating with said treatment chamber, whereby the surfaces of said pockets define a further extended portion of said treatment chamber.

4,241,904
MOLTEN-METAL TREATING VESSEL
Sachio Nagashima, and Makoto Wake, both of Ohita, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Aug. 13, 1979, Ser. No. 66,284
Claims priority, application Japan, Aug. 18, 1978, 53/100036; Mar. 19, 1979, 54/32044; Jul. 17, 1979, 54/90624
Int. Cl.³ C21C *7/10*
U.S. Cl. 266—209 **9 Claims**



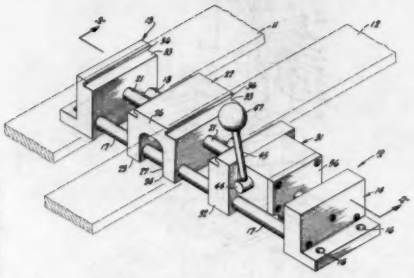
1. A molten-metal treatment vessel having an immersion drum immersible at the lower portion thereof into a bath of molten metal retained in a ladle for treating said molten metal wherein said metal is at least partly introduced into and out of said treatment vessel in a circulating flow, said treatment vessel comprising a vessel body having a lower section and an upper and lower end portion, said lower section open at said lower portion end thereof, and said immersion drum removably attached at the upper peripheral edge thereof to said lower end portion of said vessel body, said immersion drum including at least one upward flow passage and at least one downward flow passage contherein, said flow passages being spaced apart from each other, and in said immersion drum the ratio RS of the total cross sectional areas (S_1+S_2) of said upward and downward flow passages, which is the sum of the least total cross sectional area S_1 of at least one upward passages and the least total cross sectional area S_2 of at least one downward flow passage, to the cross sectional area S of said opening at the lower end of said lower section of said vessel, is not less than 0.3.

4,241,905
HEAD OR SLIDE PLATE FOR A MOLTEN-METAL SLIDE GATE
Eckehard Eisermann, Grefrath, and Dieter Beckers, Neunkirchen, both of Fed. Rep. of Germany, assignors to Martin & Pagenstecher GmbH, Cologne, Fed. Rep. of Germany
Filed Jul. 9, 1979, Ser. No. 55,512
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830199
Int. Cl.³ C21C *5/42*
U.S. Cl. 266—236 **4 Claims**



1. A molten metal slide gate comprising head and slide plates, one of said plates comprising a refractory plate having a circular opening and a refractory ring positioned in the opening, one side of the plate and ring cooperatively forming a flat slide surface, the respective peripheries of the opening and ring being shaped so as to cooperatively form an annular chamber spaced between the opposite sides of said one of the plates and the slide surface and an annular passage extending axially from the chamber to the slide surface, a tar ring positioned in the chamber and which vaporizes when the refractory ring is heated by molten metal, and porous refractory filling the annular passage and through which the vaporized tar can migrate to the slide surface.

4,241,906
SKI VISE
Duane S. Cole, 1941 Walters Ct., Fairfield, Calif. 94533
Filed Nov. 13, 1979, Ser. No. 93,755
Int. Cl.³ B25B *1/20*
U.S. Cl. 269—43 **3 Claims**

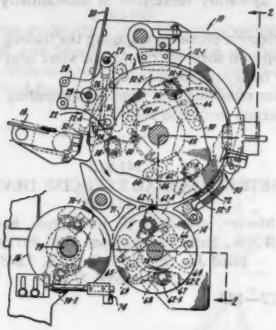


1. A vise for holding a pair of skis in either the flat or the vertical position exposing the edges comprising
spaced apart base members adapted to be fastened to a supporting surface,
laterally spaced apart guide ways extending between said base members and fixedly secured thereto,
a clamping rod extending between said base members,
floating jaw means freely slidable along said ways and said clamping rod,
clamping jaw means arranged for sliding movement along said ways and said clamping rod between one of said base members and said floating jaw means, said clamping jaw means including means gripping said clamping rod for fixing said clamping jaw means in a selected position, said gripping means serving to apply force in the direction of the other one of said base members,
an actuator means coupled to said gripping means and disposed entirely to one side of said ski vise so that no portions of said ski vise extend beyond said base members.

4,241,907
SIGNATURE MACHINE HAVING AN ADJUSTABLE TIMING CONTROL OF THE EXTRACTION MEANS
William B. McCain, Hinsdale; James F. Cosgrove; John Vente, both of Western Springs, and Thomas R. Flavin, Mokena, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 803,750, Jun. 6, 1977, Pat. No. 4,162,066. This application Apr. 9, 1979, Ser. No. 28,057
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **5 Claims**

1. In a cyclically operable signature feeding machine of the type having extraction means for extracting signatures one by one from a hopper by applying negative atmospheric pressure thereto, said means then transporting each signature to a rotatable extracting cylinder where the extraction means releases it by applying atmospheric pressure, the extracting cylinder having means for further processing of signatures, the im-

provement comprising timing means responsive to the machine cycle speed for proportionally controlling the time for supply-



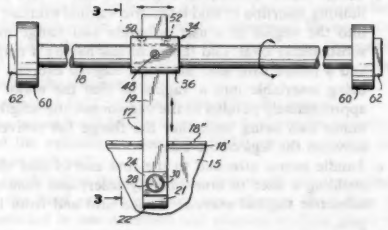
ing both negative pressure and atmospheric pressure to the extraction means.

4,241,908

JACKET CLAMPING DEVICE FOR A PAPER STUFFING MACHINE

Joel A. Marcus, 68-61 Yellowstone Blvd., Forest Hills, N.Y. 11375

Filed Aug. 24, 1979, Ser. No. 69,268
Int. Cl.³ B65H *5/30*
U.S. Cl. 270—55 . 10 Claims



1. A clamping device for a stuffer having a V-shaped pocket with one inclined stationary platen, and having associated with the pocket a horizontal clamping bar which is oscillatable about its longitudinal axis between an idle position and a clamping position, said clamping device comprising an elongated resilient arm, means mounting said arm on said clamping bar to extend radially therefrom, and a resilient pad mounted on the tip of the arm in a position to face the inclined stationary platen when the clamping bar is in its operative position, said pad engaging the inner surface of a half of a folded jacket in the pocket when said clamping bar is in operative position.

4,241,909

DOCUMENT STACKING APPARATUS

Gary J. Murphy, Potomac, and George F. Norris, Kensington, both of Md., assignors to Input Business Machines, Inc., Rockville, Md.

Filed Jul. 21, 1978, Ser. No. 926,729
Int. Cl.³ B65H *29/68*
U.S. Cl. 271—182 5 Claims

1. Document stacking apparatus for continuously stacking a plurality of documents in the sequential order in which they are fed into said apparatus, comprising:

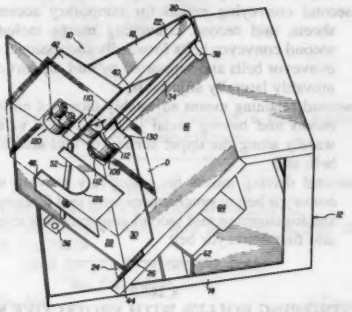
bed means inclined with respect to the horizontal plane upon which documents to be stacked can be deposited;

means for feeding said documents into said apparatus;

document guide means for guiding said documents along an open-ended predetermined path from said feeding means;

deflecting means operatively cooperable with said guide means for defining said predetermined path;

a baffle movably mounted upon said bed means and operatively cooperable with said guide means for defining a stacking cavity, said baffle being biased toward a first position whereby said stacking cavity is minimized and being moveable under the influence of incoming documents to be stacked against said bias toward a second position so as to expand said stacking cavity and accommodate successive documents to be stacked, said baffle



being slidably disposed upon said bed means between said first and second positions and being of a length sufficient to accommodate variously sized documents without adjustment and being movable only along a line between said first and said second positions in order to accept said plurality of documents, said baffle otherwise remaining in a substantially stable position; and

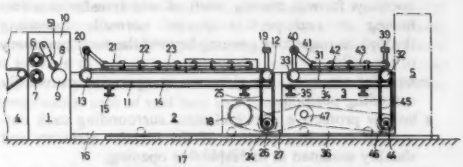
document retarding means disposed adjacent one end of said predetermined path and rotatable in a direction counter to that which would normally feed said documents along said predetermined path for retarding the conveyance of said documents to be stacked so as to prevent the escape of said documents to be stacked from said stacking cavity and to facilitate the stacking of said documents within said stacking cavity.

4,241,910

SHEET DELIVERING APPARATUS

Masaharu Matsuo, 17-3, Higashi-Komagata, 3-chome, Sumida-ku, Tokyo, Japan

Filed Apr. 26, 1979, Ser. No. 33,688
Claims priority, application Japan, Apr. 30, 1978, 53/051186
Int. Cl.³ B65H *29/20, 29/16, 29/66*
U.S. Cl. 271—202 9 Claims



1. Sheet delivering apparatus for transporting sheets from a processing maching to another device comprising:

support means:

roller means mounted on said support means for longitudinal separation of said sheets;

said roller means including top and bottom rolls, said top roll being rotatably supported at a location rearwardly eccentric relative to said bottom roll, said bottom roll being driven to rotate at a peripheral speed higher than the speed of sheet delivery of said processing machine;

first conveying means for lateral separation of said sheets, said first conveying means including paired first conveyor belts forwardly successional relative to said bottom roll, said first conveyor belts being supported by said support means to be movably laterally adjustable;

first retaining means adjustably mounted on said support means having a series of rolls and links extending forwardly along the upper surface of said first conveyor belts;

first driving means for continuously moving said first conveyor belts in synchronism with said processing machine;

second conveying means for temporary accumulation of sheets, said second conveying means including paired second conveyor belts forwardly successional to said first conveyor belts and supported by said support means to be movably laterally adjustable;

second retaining means adjustably mounted on said support means and having serial links and rolls extending forwardly along the upper surface of said second conveyor belt; and

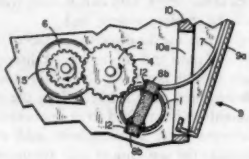
second driving means for selectively moving said second conveyor belt in synchronism with said first conveyor belt and for stopping said second conveyor belt irrespective of said first conveyor belt.

4,241,911

STRIPPING ROLLER WITH PROTECTIVE SLEEVE

Conrad E. Lee, Golden Valley, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Oct. 1, 1979, Ser. No. 80,688
Int. Cl.³ B65H *29/20, 27/00*
U.S. Cl. 271—314 **4 Claims**



1. A stripping and transfer roller assembly for discharging from a processing machine into a storage bin, individual sheets of film and stacking the same in upstanding position, said assembly comprising,

a hollow roller forming a stripping and transfer roller,

said roller having a plurality of axially spaced apart openings formed therein,

soft resilient compressible stripping and transfer elements respectively inserted into said hollow roller through the openings formed therein, each of said transfer elements having an end portion thereof normally extending through its respective opening beyond the outer periphery of the roller,

means for retaining the elements in operative outwardly extending position,

a hollow protective sleeve element surrounding each outwardly extending portion of the transfer elements and slidably mounted in its respective opening,

means on each of said protective sleeve element for limiting the outward sliding movement to retain said protective elements in said openings in operative position surrounding the respective outwardly extending portions of the resilient stripping and transfer elements but permitting said protective elements to move inwardly with said outwardly extending resilient portions when the transfer elements are compressed,

said roller being oriented to drive the upper portion of the sheet upwardly therefrom in substantially upright position,

said protective elements engaging the trailing lower edge of said upright sheet to transfer the same laterally outwardly away from said roller, and

means for receiving said sheet in upstanding position when discharged from said roller,

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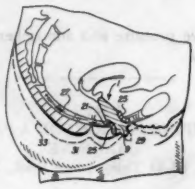
4,241,912

ISOMETRIC VAGINAL EXERCISE DEVICE AND METHOD

Lloyd F. Mercer, and Jean H. R. Mercer, both of 2509 N. Campbell Ave., Suite 196, Tucson, Ariz. 85719

Filed Jan. 29, 1979, Ser. No. 7,045
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—125 **9 Claims**



1. An isometric vaginal exercise device comprising:

a. a shaft having first and second ends, said shaft being substantially round;

b. flange means connected to the first end of said shaft for limiting insertion of said isometric vaginal exercise device into the vagina of a user, wherein said flange means is substantially oval, said flange means having a major axis and a minor axis, said isometric vaginal exercise device being insertable into a vagina so that the major axis is approximately parallel to the vaginal slit, the length of the minor axis being such that the flange fits conveniently between the legs of the user;

c. handle means attached to the first end of said shaft for enabling a user to conveniently insert and remove said isometric vaginal exercise device into and from her vagina,

said shaft being rounded at its second end to ease insertion of said isometric vaginal exercise device,

said shaft having a longitudinal axis and a substantially concave portion adjacent said flange, a portion of said shaft immediately adjacent to said flange having a first diameter, the diameter of said shaft gradually decreasing to a second diameter at a first point on said axis, said first point being located approximately centrally of said concave portion, the diameter of said shaft gradually increasing to a third diameter at a second point on said axis, said second point being located at an end of said concave portion, a first portion of said isometric vaginal device being located between first and second planes perpendicular to said axis and passing through said first and second points, respectively, the distance between said first and second points and said second and third diameters being selected to allow sufficient gripping of said first portion to effect substantial lifting of the pelvic diaphragm of the user when she tightens her vaginal muscles on said isometric vaginal exercise device, enabling the user to achieve isometric exercising of the vaginal muscles and muscles of the pelvic diaphragm while the muscles of the pelvic diaphragm are in a shortened configuration resulting from said lifting,

said isometric vaginal exercise device being of sufficiently solid construction to substantially resist all muscular con-

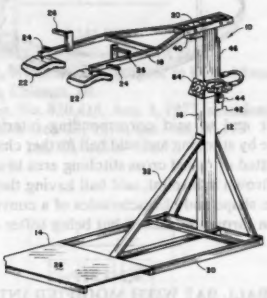
tractions of the user without substantial deforming of said isometric vaginal device.

4,241,913

RAPID THRUST EXERCISE MACHINE

Don L. Zwayer, and Martin D. Sadler, both of Tulsa, Okla., assignors to Natural Energy of Oklahoma, Inc., Tulsa, Okla.

Filed Sep. 5, 1978, Ser. No. 939,393
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—130 **7 Claims**



1. An exercise machine comprising:
(a) a frame;
(b) an exercise bar pivotally carried by the frame at a fulcrum point;
(c) means for operator actuation carried by one end of the exercise bar;
(d) an elongated hydraulic cylinder having cooperating piston and piston rod pivotally connected between the frame and the opposite end of the exercise bar, the means for operator actuation and the cylinder being on opposite sides of the fulcrum point;
(e) a separate fluid reservoir carried by the frame;
(f) line means for fluid communication between the reservoir and the cylinder on one side of the piston opposite the piston rod; and
(g) a combination flow restriction and check valve provided in the fluid communication line wherein fluid flow is restricted in one direction and allowed to flow freely in the opposite direction whereby an applied force on the means for operator actuation in one direction causes a compression force on the piston rod.

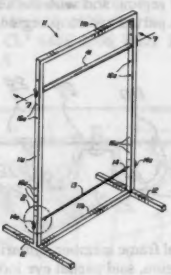
4,241,914

ELASTIC APPARATUS FOR RESISTING AND ASSISTING A PERSON PERFORMING EXERCISES

Donald D. Bushnell, 733 S. Jones, Mesa, Ariz. 85204

Filed Jun. 4, 1979, Ser. No. 45,273
Int. Cl.³ A63B *21/02*
U.S. Cl. 272—136 **1 Claim**

1. Apparatus for resisting and assisting a person performing exercises comprising
(a) a frame;
(b) elongate tensioned elastic means, attached at both ends thereof to said frame and responsive
(i) to yieldingly resist muscular exertion by said person when deflected by said exertion by said person during said exercises, and
(ii) to yieldingly assist generally upward bodily movement during said exercises when downwardly deflected by body weight of said person before said exercise is performed, said upward bodily movement occurring during said muscular exertion against at least one surface substantially fixed in position during said exercise;
(c) means to adjust the yielding resistance and assistance of said elastic means;
(d) manual means for selectively varying the position of the entire length of said elastic means in said frame; and



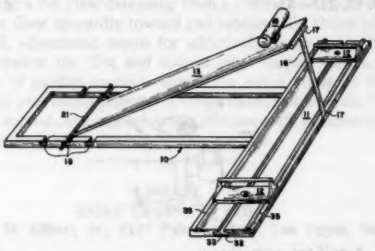
(e) means for maintaining said frame in a fixed position during the performance of said exercises.

4,241,915

ADJUSTABLE EXERCISE APPARATUS

David Noble, and Donald Noble, both of R.F.D. 6, Box 358, Richmond, Va. 23231

Filed Jan. 16, 1979, Ser. No. 3,830
Int. Cl.³ A63B *23/02*
U.S. Cl. 272—144 **8 Claims**



1. An adjustable, compactly foldable exercise apparatus comprising an elongated base, track means communicating with said base at right angles thereto forming a substantially coplanar foundation, a pair of handgrips engaged by said track means in adjustable spaced relationship, a flat elongated board positioned generally above said base and having foot engaging means adjacent the forward end thereof, elevating means pivotably connecting said foundation with said board in a manner to adjustably incline said board with respect to said base, and positioning means adjacent the rearward end of said base adapted to anchor the rearward end of said board so as to cause said board to assume a desired angle of inclination with respect to said base, whereby said apparatus is adapted for performing sit-ups and is adapted for performing push-ups when said board is lowered to a position substantially parallel to said base, said apparatus possessing a plane of symmetry which includes the longitudinal axes of said base and board.

4,241,916

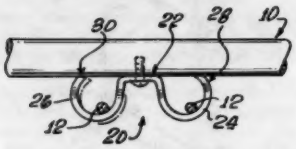
NO-TIE SPORTS GOALS

Robert J. Palm, 1740 E. Brookdale, LaHabra, Calif. 90631

Filed Oct. 31, 1979, Ser. No. 90,006
Int. Cl.³ A63B *63/00, 63/08*
U.S. Cl. 273—1.5 R **5 Claims**

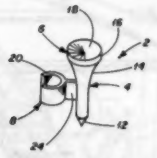
1. A sports goal assembly, comprised of a goal frame mem-

ber, supporting means, a goal net, and a plurality of "no-tie" net attaching members spaced about the extent of said goal frame member, each of said net attaching members accepting one of an equal plurality of cord loops formed on the periphery of the said goal net, each of said net attaching members being configured so as to be rigidly attached to said goal frame member at its central region, and with each said net attaching member containing a partial eye loop region, depending from



the surface of said goal frame member, unitarily formed at each end of said central region, said partial eye loop regions closing toward but not upon said central region, with the extremities of the material forming the said net attaching member assuming tension contact with said goal frame member such that said cord loop may be passed from the exterior to the interior of said eye loop regions, but such that the reverse passage of said cord loop is precluded.

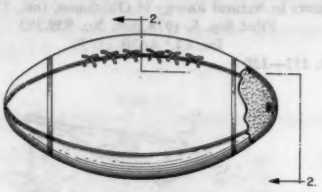
4,241,917
GOLF TEE
Murray Cohen, 4 Stoneham, Livingston, N.J. 07424
Filed Dec. 1, 1978, Ser. No. 965,694
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—33 6 Claims



1. A golf tee, comprising:
an elongated shank member;
an enlarged, cupped head member attached to one end of said shank member for supporting a golf ball thereon;
a limiting member attached to said shank member for limiting the extent of insertion of said shank member into the ground to locate said cupped head member at a predetermined level above ground level, said limiting member being attached in parallel relation to the longitudinal dimension of said shank member and along one side thereof;
said limiting member including a golf club mounting means, said mounting means being adapted to releasably hold said golf tee on a golf club shaft with said shank member disposed in parallel relation thereto, said mounting means defining a member of substantially U-shaped configuration.

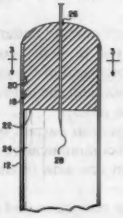
4,241,918
LIGHTER AND SOFTER RECREATIONAL BALLS
Chester F. Massino, 43 Golf Ct., Sandwich, Ill. 60548
Filed Apr. 12, 1979, Ser. No. 29,316
Int. Cl.³ A63B *41/00*
U.S. Cl. 273—65 E 3 Claims

1. A ball comprising:
(a) an interior comprised of from about 3 to about 4 ounces of a polyester batting fill comprised of 100% polyester untreated extruded fiber having a denier of from about 4.5 to 5.0,
(b) a 4-piece wool batting interior cover,
(c) a 4-piece polyester double-knit outer cover each of which said four pieces of said polyester double-knit outer cover are substantially identical and are secured to each



other and to said corresponding interior wool batting piece by stitching and said ball further characterized by an elevated or raised cross stitching area to enable the ball to be thrown in a spiral, said ball having the general appearance, shape and characteristics of a conventional football when thrown or kicked but being softer and lighter.

4,241,919
BASEBALL BAT WITH MODIFIED INTERNAL AIR PRESSURE
Ronald Foreman, King Manor Dr., King of Prussia, Pa. 19406
Filed Dec. 26, 1978, Ser. No. 973,039
Int. Cl.³ A63B *59/06*
U.S. Cl. 273—72 A 5 Claims



1. A metallic bat comprising sidewalls which terminate at one end in a closed end and at the other end in an open end, the open end being closed with a resilient end plug secured to the interior surface of the sidewalls to define an interior space capable of maintaining a quantity of confined gas therewithin, the confined gas being characterized by a pressure other than atmospheric, the resilient end plug having a passage therethrough in communication with the interior space, the passage being open when a pressure introducing needle is inserted through the plug to introduce gas into the interior space and the passage being closed when the needle is withdrawn to seal the said interior space,
the said pressure being appropriate to produce a natural frequency of free vibration of such frequency and amplitude in the bat that when coupled with the excitation frequency caused by the impact of the bat striking a ball, resonance results.

4. The method of modifying the initial pressure of a gas entrapped within the interior of a metallic baseball bat of the type having an interior space defined by the bat sidewalls and having one closed end and one open end, the open end being closed by a resilient plug, comprising the steps of
forming an opening through the resilient plug part of the bat construction in communication with the interior space by forcing a hollow conduit therethrough until its inner end

reaches the interior space and its outer end extends outwardly of the plug;

determining the critical structural frequency of the bat;

introducing a gas at a pressure other than the initial pressure to the outer end of the conduit and forcing the gas through the conduit to establish the final pressure of the gas in the interior space;

pressurizing the gas to a final pressure necessary to achieve critical structural frequency in the bat; and

removing the conduit and automatically closing the opening through the resilient plug and maintaining the final pressure of the gas in the interior space.

4,241,920

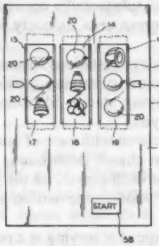
AMUSEMENT APPARATUS

Donald E. Hooker, Wilmette, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Continuation of Ser. No. 820,410, Aug. 1, 1977, abandoned. This application Oct. 25, 1979, Ser. No. 88,173

Int. Cl.³ A63F *5/04*

U.S. Cl. 273—143 R **7 Claims**



1. In an amusement apparatus having a plurality of rotating drums, each bearing a plurality of symbols, certain combinations of which have different play values and entitle a player to a reward, and including means for rotating said drums to initiate a playing cycle, means for arresting rotation of said drums before the end of a playing cycle to display a first combination of symbols, means for possibly effecting additional rotation of one of said drums during the playing cycle in which said first combination of symbols is not a winning combination so as to possibly cause to be displayed a second combination of symbols having a different play value, thereby according the player an additional opportunity to win a reward, said means for possibly effecting additional rotation being dependent upon said first combination of symbols not being a reward winning combination whereby said means for possibly effecting additional rotation of said one of said drums during the remainder of the playing cycle is dependent upon random means randomly actuating said means for effecting additional rotation during the said remainder of said playing cycle, whereby if the first combination of symbols is a reward winning combination the cycle is terminated and whereby if the first combination of symbols is not a reward winning combination and the random means is randomly actuated during the remainder of the playing cycle a second chance to win is afforded by said random means automatically actuating said one of said drums, the improvement comprising means for disabling said arresting means to permit additional rotation of one of said drums by said rotating means, first timing means operatively associated with a first switch means for closing said first switch means for at least one predetermined time interval at random times during the playing cycle, second timing means independent of said first timing means operatively associated with a second switch means for closing said second switch means for a predetermined time interval after the display of said first combination, and means for actuating said disabling means upon coincidental closing of said first and second switch means to cause to be displayed the second combination of symbols having a different play value, thereby according the player the additional opportunity to win a reward.

4,241,921

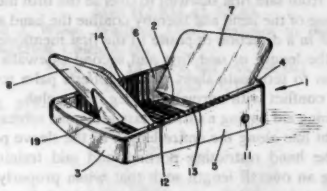
BINGO CARD HOLDER

David R. Miller, 6337 Bannock Way, Las Vegas, Nev. 89107

Filed Mar. 26, 1979, Ser. No. 23,706

Int. Cl.³ A63F *3/06*; B42F *17/14*

U.S. Cl. 273—148 A **3 Claims**



1. A holder for a plurality of bingo cards comprises a container having a floor, side walls, front and rear walls, and an open top, said side walls having a height substantially less than bingo cards to be supported in the holder, first pivotally mounted card support means for retaining a plurality of cards in a position slanted toward the front wall comprising a flat plate extending from a central portion of the container floor upwardly toward and substantially above said front wall, second pivotally mounted card support means for retaining a plurality of cards in a position slanted toward the rear wall comprising a flat plate extending from a central portion of the container floor upwardly toward and substantially above said rear wall, adjustment means for selectively varying the distance between the first and second card support means, a plurality of parallel grooves across the entire width of the holder for preventing slippage of bingo cards, and wherein the first and second card support means fold inwardly adjacent the container floor when the holder is not in use.

4,241,922

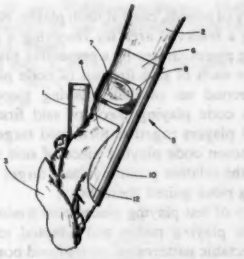
GOLF TRAINING AID

Denvier D. Elliott, Jr., 5127 Palmyra Ave., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 893,960, Apr. 6, 1978, abandoned. This application May 10, 1979, Ser. No. 37,497

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—189 A **4 Claims**



1. A golf training aid for attachment to a golfer's lower forearm and wrist of the leading arm of a golf swing to facilitate learning proper technique for chip and pitch shots, said aid comprising

a sleeve portion adapted to substantially encircle the lower forearm and wrist of the leading arm in a golf swing,

attachment means for retaining said sleeve portion in place,

a hand restricting portion including a substantially straight wall portion fully overlying the back of the golfer's hand to preclude hand motion in the direction of the foward swing about an axis extending transversely of the wrist, said restricting hand portion including a first side wall overlying the second metacarpal bone of the hand and thereby confining the hand against motion generally parallel to said axis, and a second sidewall oppositely disposed from said first sidewall to overlie the fifth metacarpal bone of the hand and thereby confine the hand against motion in a direction opposite to the first mentioned motion, the length of said first and second sidewalls being such as to terminate short of the golfer's palm so as to avoid conflict with normal gripping of the club,

said training aid having a surface extending in a substantially straight line along the entire length of the sleeve portion and the hand restricting portion, and said training aid having an overall length such that when properly positioned on the golfer's wrist, the device extends from above the wrist over the first set of knuckles.

4,241,923

BOARD GAME

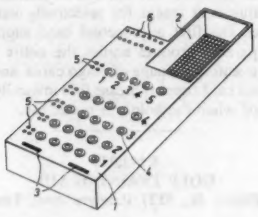
Mordecai Meirovitz, Haifa, Israel, assignor to Invicta Plastics Limited, Great Britain

Filed Jan. 10, 1979, Ser. No. 2,366

Claims priority, application United Kingdom, Jan. 14, 1978, 01559/78

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—265 **9 Claims**



1. A game comprising:

a plurality of code playing pieces of contrasted characteristics for forming a target code and comprising a first set of code playing pieces and a second set of said code playing pieces;

a plurality of boards, one for each player, each of said boards having a reserved area for receiving a pair of said code playing pieces chosen by a respective player and comprising one each of said first set of code playing pieces and said second set of code playing pieces, wherein said chosen code playing piece of said first set by each of several players together form said target code and each said chosen code playing piece of said second set determines the relative position in said target code of the code playing piece paired therewith;

a plurality of test playing pieces conforming to said first set of code playing pieces and adapted to be mounted in preselectable patterns on each of said boards in successive groups for simulating said target code;

and a plurality of marker elements each of which is mountable on any one of said boards for signalling the correctness in relation to the code playing pieces mounted on the selected one of said boards of the characteristics and relative positioning of the test playing pieces of a test group selected by a player.

4,241,924

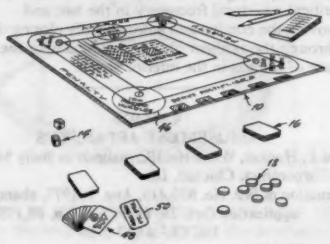
OLYMPIC EVENT BOARD GAME

Frank J. Arcara, 145-77 4th Ave., Whitestone, N.Y. 11357

Filed Jan. 29, 1979, Ser. No. 7,595

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—277 **9 Claims**



1. A board game comprising:

a playing board having a plurality of concentrically increasing scoring areas substantially covering the entire playing board, each scoring area uniquely identifiable from the others;

a series of event playing stations formed peripherally about said playing board overlying portions of said scoring areas, each playing station identified by the particular event to be played;

a set of cards associated with each of said playing stations for serving as a first chance determining means;

a playing piece for each player, all the playing pieces being simultaneously positionable within a single playing station;

a standard pair of dice for serving as a projectile to land onto particular scoring areas and simultaneously serving as a chance determining means for selecting a particular card from within each set of the first chance determining means;

scoring sheets having all of the events tabulated thereon.

4,241,925

TOY HAVING PROJECTILE MOVABLE IN BOTH COORDINATES OF A PLANE

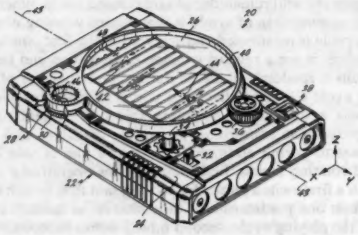
Hiroyuki Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 971,645, Dec. 21, 1978. This application Feb. 22, 1979, Ser. No. 14,056

Claims priority, application Japan, Oct. 16, 1978, 53-127022

Int. Cl.³ A63F *9/00*

U.S. Cl. 273—316 **30 Claims**



1. A toy which comprises:

a support structure;

an object means serving as a target;

an object means positioning means located on said support structure, said object means positioned on said object

means positioning means permitting said object means to move along the x coordinate of an x, y, z coordinate system;

a projectile means capable of attacking said object means;

projectile means positioning means positioning said projectile means on said support structure permitting said projectile means to move along the x and y coordinates of an x, y, z coordinate system;

said object means and said projectile means capable of assuming an interference position wherein both said object means and said projectile means have substantially the same x and y coordinate points but different z coordinate points;

detection means for detecting when said object means and said projectile means are in said interference position;

projectile drive means for moving said projectile means along the x coordinate of an x, y, z coordinate system, said projectile drive means including a rotating drive capable of rotating in a first direction and reversing and rotating in a second direction, said rotating drive rotating in said first direction when said projectile means is attacking said object means to drive said projectile from a ready position toward said object means and responsive to said projectile means and said object means not being in said interference position returning said projectile to said ready position, said rotating drive reversing direction of rotation and rotating in said second direction in response to said projectile means and said object means being in said interference position to return said projectile means to said ready position.

4,241,926

TONE ARM ASSEMBLY

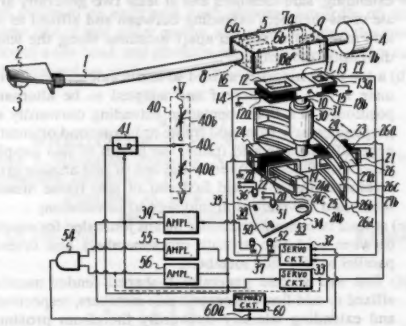
Satoshi Kusaka, Tokyo, and Kuninori Shino, Higashimurayama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 8, 1979, Ser. No. 36,992

Claims priority, application Japan, May 8, 1978, 53-54304; May 8, 1978, 53-54305

Int. Cl.³ G11B *3/10*

U.S. Cl. 274—23 R **13 Claims**



1. Apparatus for controlling a tone arm comprising:

a rotatable shaft for supporting said tone arm;

a horizontal drive motor for driving said tone arm in the horizontal direction with respect to a record disc;

horizontal motor drive means for energizing said horizontal drive motor in such a manner that said tone arm is moved between at least a rest position and a reproducing position relative to the record disc; horizontal velocity detecting means coupled to said tone arm for detecting the horizontal velocity of said tone arm, said horizontal velocity detecting means including a permanent magnet and a coil disposed in the magnetic field of said permanent magnet, one of said permanent magnet and coil being mechanically coupled to said tone arm, and said horizontal velocity detecting means and said horizontal drive motor being positioned oppositely to each other with respect to said shaft; and

means for supplying a voltage generated by said coil in response to horizontal movement of said tone arm to said horizontal motor drive means, whereby said horizontal drive motor is controlled to suppress detected horizontal vibrations of said tone arm.

4,241,927

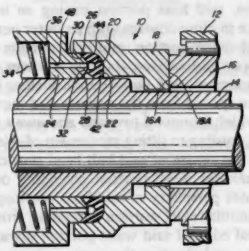
MECHANICAL SEAL

Winfred J. Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 13, 1979, Ser. No. 66,102

Int. Cl.³ F16J *15/38*

U.S. Cl. 277—87 **4 Claims**



1. In a mechanical seal assembly having non-rotatable and rotatable seal rings with opposed faces, means supporting said rings, a cavity in one of said seal rings removed from its seal face to receive a U-cup member of elastomeric material, and means urging said U-cup member into said cavity and also one of said seal rings toward the other of said seal rings, the improvement comprising:

said cavity having a defining surface which intersects a pair of surfaces of said one seal ring which are normal to one another and defines a substantially right angle with each surface of said pair of surfaces;

said U-cup having a surface in full contact with said defining surface and a cylindrical surface in contact with said supporting means, said cylindrical surface remaining substantially constant in length for all operating conditions of said seal assembly.

4,241,928

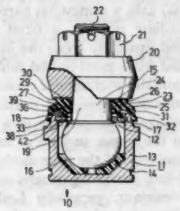
BOOT SEAL

Akira Nemoto, 22 aza-Nishihamagurizawa, Ueta-cho, and Yasunori Hamaguchi, 97 aza-Kanbezaka, Ueta-cho, Toyohashi-shi, Aichi-ken, Japan

Filed Dec. 7, 1978, Ser. No. 967,468

Int. Cl.² F16J *15/32*

U.S. Cl. 277—212 FB **5 Claims**



1. In combination:

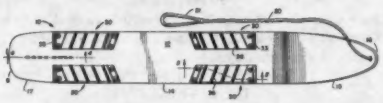
(i) a ball joint comprising:
(a) a socket housing having an open end with an inturned flange at said open end, said flange being formed with an opening at inner periphery thereof, said flange having a flat outer surface,
(b) a bearing member secured internally of said socket housing and having a part spherical internal surface,
(c) a ball stud including a spherical head portion and a shank portion integral with said head portion, said head portion being disposed and held rotatably, within said socket housing between said flange and said part-spherical internal surface, said shank portion extending through said open end of the socket housing,
(d) a joint member secured to said shank portion spaced from said head portion,
(ii) a boot seal formed wholly of resiliently deformable material, said boot seal including,
(A) an annular boss portion positioned about said shank portion, said boss portion having an inner peripheral surface in close contact with an outer peripheral surface of said shank portion, said boss portion further having an upper end surface abutting a lower surface of said joint member, said boss portion further having a lower surface spaced from the open end of the socket housing and which is moved towards and away from said open end according to tilting movement of said shank portion about the centre of said ball head portion,
(B) an annular waist portion extending outwardly from the outer periphery of said boss portion,
(C) an annular skirt portion extending from an outer peripheral edge of said waist portion towards said socket housing and abutting the upper outer periphery of said socket housing,
(D) an annular flare portion extending downwardly and outwardly from an outermost peripheral portion of the lower face of the boss portion towards an upper flat surface of the inturned flange of the socket housing, said flare portion having its free end in sliding contact with said upper flat surface so as to be movable radially of said flange in response to tilting of said shank portion, a space bounded by the opening of the inturned flange, ball head portion, the ball shank portion, the lower surface of the boss portion and the internal surface of the flare portion being filled with grease.

4,241,929

SKI BOARD WITH IMPROVED FOOT TREADS

Paul F. Curry, Raven, Va., assignor to Jem Corporation, Marion, Va.

Filed Dec. 19, 1978, Ser. No. 970,856
Int. Cl.³ B62B *15/00*
U.S. Cl. 280—12 H **14 Claims**



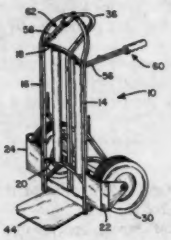
1. In a surf-type ski of the type defined by a ski member having a longitudinal axis, a somewhat narrow width, a generally planar intermediate portion, a front portion extending mildly upwardly and inwardly from the intermediate portion to the front end, said front portion and said intermediate portion having a substantially rectangular cross section transverse to said longitudinal axis, and a rear portion extending rearwardly from the intermediate portion to a rear end, and feet receiving means on the upper surface of said ski member for receiving at least one foot of the user of the ski, the improvement wherein said foot receiving means comprises at least a pair of foot skid-resistant, generally L-shaped elastomeric members, one positioned in front and the other behind the transverse center line of the ski for receiving the feet of the skier in a readily removable relationship, an upturned lip of the front L-shaped member being positioned toward the front of the ski, an upturned lip of the rear L-shaped member being positioned toward the rear of the ski, the upturned lips of each L-shaped member serving to fixedly position the feet of the skier to prevent fore and aft slippage between the feet of the skier and the ski, said pair of L-shaped members being secured to an upper surface of said ski, wherein each of said generally L-shaped members includes an elongated leg secured to said upturned leg, said elongated leg defining a plurality of spaced ribs along the length thereof and a recess between each of said spaced ribs to accommodate snow and to permit the boot of the user to be cleaned.

4,241,930

TWO-WHEELED DOLLY

Dwain C. Bell, 1400 Marshall St. NE., Minneapolis, Minn. 55413, and Lloyd E. Anderson, 6408 - 74th Ave. North, Minneapolis, Minn. 55428

Filed Oct. 25, 1978, Ser. No. 954,407
Int. Cl.³ B62B *1/04*
U.S. Cl. 280—47.29 **2 Claims**



1. A multi-purpose hand truck comprising in combination:
(a) a frame member formed from tubing having a generally rectangular cross-section, said frame member comprising first and second parallel and spaced apart, longitudinally extending, side members and at least two generally arcuate cross-members extending between and affixed to said side members at spaced apart locations along the length dimension thereof;
(b) a toe-plate hingedly affixed to said frame member proximate a first end thereof and adapted to be alternately positioned in a first orientation extending outwardly and perpendicularly from said frame or in a second orientation generally flush to said frame, the length of said toe-plate being insufficient to overlay the one of said arcuate cross-members closest to said first end of said frame member when said toe-plate is in said second orientation;
(c) at least two elongated roller means journaled for rotation between said two arcuate cross-members and oriented parallel to said side members;
(d) first and second generally L-shaped fender members affixed to said first and second side members, respectively, and extending laterally outwardly therefrom proximate said first end of said frame member for a first predetermined distance and an end portion bent rearwardly for a second predetermined distance, said end portions of said first and second fender members having an aperture formed therethrough, said toe-plate being disposed between said fender members and being generally coplanar with the portion of said L-shaped fender members extending laterally outwardly from said side members when said toe-plate is in said second orientation;
(e) a cylindrical rod affixed to said frame and extending transversely thereto proximate said first end thereof, the end portions of said rod passing through said apertures formed in said end portions of said first and second fender member;
(f) a pair of wheels of a predetermined diameter journaled

for rotation on said cylindrical rod at a location outboard of said members and within said first predetermined distance of the lateral extension of said fender member; and

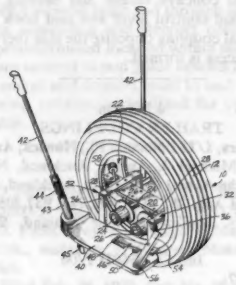
(g) handle means affixed to said frame member proximate the second end thereof and extending rearwardly of said frame for a distance such that when the ends of said handle means abut a horizontal surface, said frame member is in a generally horizontal plane.

4,241,931

AUTOMOBILE TIRE RIDING VEHICLE

Donald H. Healy, 3315 NW. Golden Pl., Seattle, Wash. 98107

Filed Apr. 16, 1979, Ser. No. 30,350
Int. Cl.³ B62K *17/00*
U.S. Cl. 280—205 **10 Claims**



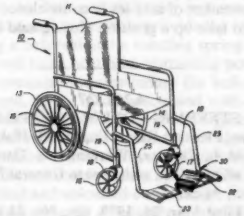
1. The combination with an automobile tire having spaced apart circular beads, adjoining side walls, and a ground-engaging tread interconnecting said side walls, a tire riding vehicle comprising: a base support extending parallel to the space between tire beads; two spaced apart axles extending at right angles to, and connected with, said base support; two spaced apart roller means rotatively mounted on each of said axles and each adapted to roll on a tire bead; two spaced apart flange means mounted on each axle, each disposed inwardly of, and adjacent one of said roller means, and each engaging the inner surface of a tire bead; and platform means, on which a rider can stand, mounted on said two parallel axles.

4,241,932

WHEELCHAIR STEERING APPARATUS

William F. Hartmann, Syracuse, N.Y., assignor to Gerald W. Rothschild, Fayetteville, N.Y.

Filed Sep. 18, 1979, Ser. No. 76,586
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—265 **8 Claims**



1. A wheelchair apparatus having an occupant seating means carried upon a frame and a plurality of wheels for moving the apparatus, the apparatus further including

at least one steering caster carried in a fork that is attached to the frame for rotational movement about a substantially vertical axis for determining the direction of movement of the wheelchair,

a footrest secured to said frame,

a turntable rotatably mounted upon the footrest in coplanar relationship therewith, said turntable being adapted to receive the foot of the occupant thereupon whereby the turntable can be turned by said foot,

a lever bar secured to the fork and extending outwardly therefrom,

an elongated link that is operatively connected by pivotable connector means at one end to the extended end of said lever bar and at the other end to the outer periphery of said turntable whereby movement of the turntable will produce a corresponding movement of the wheel, and

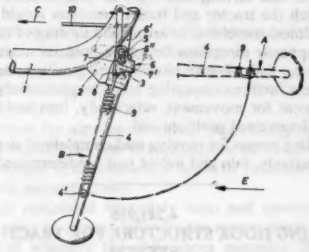
stop means secured to the turntable on either side of the link for contacting said link and thus limiting the amount of rotation afforded said turntable.

4,241,933

SIDE SUPPORT FOR MOTORCYCLE

Peter Gratza, and Heinz Estel, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,884
Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721180
Int. Cl.³ B62H *1/02*
U.S. Cl. 280—301 **8 Claims**



1. A parking support device for a two, tandem wheeled vehicle having a frame, said device comprising: a mounting means fixed to said frame; a side support mounted on said mounting means for pivotal movement about a first axis, between a ground engaging parking position and a retracted, driving position; a pivot lever means mounted on said mounting means for pivotal movement about a second axis positioned above said first axis; means for pivoting said lever means about said second axis from a first to a second position; spring means having two ends; means for connecting one of said two ends to said side support; and means for connecting the other of said two ends to said lever means at a point below said first axis whereby when said lever means is in said first position said point is beyond a dead-center position causing said spring to bias said side support to said parking position, and when said pivoting means moves said lever means to said second position said point moves into a position ahead of dead-center causing said spring to move said side support into said driving position.

4,241,934

ANTI-JACKKNIFE DEVICE FOR TRACTOR-TRAILER COMBINATION

Joseph F. Buehner, 6750 State Rd., Wadsworth, Ohio 44281

Filed Dec. 22, 1978, Ser. No. 972,255
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—432 **8 Claims**

1. An anti-jackknife device for a tractor-trailer combination in which a tractor member and trailer member are connected

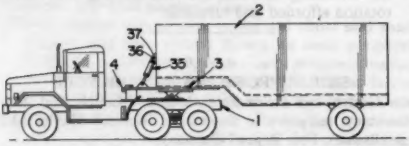
for turning relative to each other about a turning axis by a fifth wheel connection including a rockable bearing plate; mounting means supporting the rockable bearing plate on said one member for rocking about a fixed axis extending transversely of said one member, and said rockable bearing plate having a socket;

a complementary bearing plate and a connecting pin on the other member, said pin being rotatable in the socket while the bearing plates are in load bearing relation, the improvement comprising:

a first limit stop element separate from, and unconnected to, both said rockable bearing plate and said mounting means;

means for connecting the first limit stop element to said one of the members independently of, and in spaced relation, radially of said turning axis, to both said rockable bearing plate and said mounting means;

a complementary limit stop element;



support means for connecting the complementary limit stop element to the other member in a predetermined position for engagement with, and cooperation with, the first limit stop element in a manner to permit limited turning of the members in opposite directions relative to each other about said turning axis from an intermediate position in which the tractor and trailer members would be aligned for lineal travel and to arrest said turning of the members in opposite directions beyond a predetermined degree of turning out of said intermediate position, said support means further connecting said complementary limit stop element for movement, selectively, into and out of said predetermined position; and

operating means for moving said complelimit stop elements, selectively, into and out of said predetermined position.

4,241,935

COUPLING HOOK STRUCTURE FOR TRACTOR HITCH SYSTEM

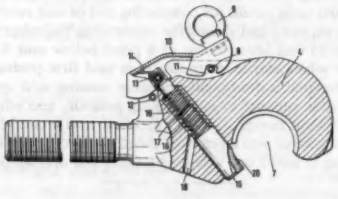
Jürgen Vollmer, Lohmar, and Norbert Müller, Ruppichteroth-Schönenberg, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,538

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831862

Int. Cl.³ B60D *1/12*

U.S. Cl. 280—461 A **2 Claims**



1. A coupling hook structure forming the upper link of a three-point linkage system for a trailer hitch adapted to receive in locking engagement therewith the coupling sphere of a coupling pin of an implement to be attached to said tractor by said three-point linkage system, said coupling hook structure comprising: a hook body defining a concave recess for receiving a coupling sphere in locking engagement therein; means defining through said hook body a rectilinear opening extending to said concave recess; a locking bolt received within said rectilinear opening and having one end adapted to extend into said recess for locking engagement with a coupling sphere received within said recess, said one end being formed with a curved locking surface adapted to the contour of said coupling sphere; spring means operatively engaging said locking bolt; a control lever having said locking bolt pivotally coupled thereto at an end of said locking bolt opposite said one end; stop means limiting movement of said locking bolt within said rectilinear opening; a generally U-shaped recess formed in said control lever at a point thereon spaced from said pivotal coupling of said locking bolt with said control lever and opening toward said concave recess, said U-shaped recess being defined by lateral sides which are arranged such that imaginary extensions thereof intersect the axis of said locking bolt; a bearing pin on said hook body located to be engaged within said U-shaped recess when said locking bolt extends into locking position into said concave recess; and bearing means interposed between said control lever and said hook body on the side of said pivotal coupling opposite the side thereof on which said U-shaped recess is formed.

4,241,936

TRAILER COUPLINGS

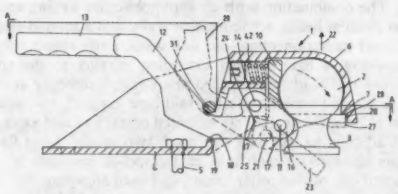
John A. Carruthers, 1/11 Pounamu Pl., Howick, Auckland, New Zealand, and Michael J. Austin, Auckland, New Zealand, assignors to John Abbott Carruthers, Auckland, New Zealand

Filed Aug. 28, 1978, Ser. No. 937,205

Claims priority, application New Zealand, Sep. 1, 1977, 185077

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—507 **3 Claims**



1. A trailer coupling part comprising: a housing so shaped as to define an entry opening adapted to receive a towing ball to complete the trailer coupling when in use; a lever pivotal in said housing between open and closed positions and having a handle; a tongue pivotal on said lever, said tongue having a shaped surface complementarily contoured to said towing ball, said shaped surface in use contacting said towing ball when the latter is in position in said housing; tongue biasing means biasing said tongue so that on movement of said lever to its open position and in the absence of a ball in said entry opening, said tongue automatically pivots down through said entry opening such that movement of said lever to its closed position causes said tongue to take up a position closing said ball entry opening.

4,241,937

STEERING COLUMN SUPPORT

Hans C. Eggen, Pleasant Ridge; Eugene M. Halajian, Mt. Clemens; Edward L. Danner, Warren, and Darrell O. Rogers, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

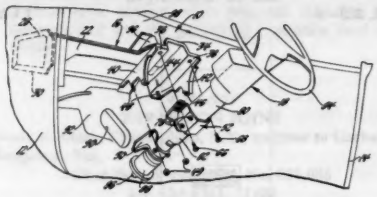
Filed Mar. 26, 1979, Ser. No. 24,167

Int. Cl.³ B62D *1/18*

U.S. Cl. 280—777 **3 Claims**

1. In combination in a vehicle body having an upwardly extending hinge pillar for a vehicle door, a cantilever support beam extending transversely to the longitudinal axis of the vehicle body from said hinge pillar to a terminal end within

said vehicle body, fastener means rigidly attaching one end of said support beam to said hinge pillar, a guide bracket secured to said terminal end of said support beam, bracket means secured to the underside of said guide bracket providing an opening therethrough, an elongated steering column extending along a longitudinal axis and normal to the axis of said transversely extending support beam and through said opening, and fastener means supporting said steering column within said opening in a predetermined location within said vehicle body, and brace means secured to said guide bracket for attaching the said terminal end of said support beam to said vehicle body so that said steering column is stabilized for operation by the vehicle operator.



4,241,938

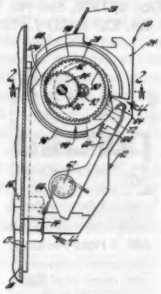
WINDING PREVENTION BELT RETRACTOR FOR PASSIVE SHOULDER BELT SYSTEM

Chimanbhai M. Patel, Troy, and Joseph J. Magyar, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1979, Ser. No. 15,948

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 280—803 **3 Claims**



1. In an automotive vehicle having a door and an occupant seat, the combination comprising: a restraint belt having one end mounted on the door and the other end mounted on the vehicle inboard the seat, a retractor provided at one of the belt ends and having a belt reel and a winding spring for winding the belt on the reel to an occupant restraining position during door closing movement and unwinding the belt during door opening movement, detent means associated with the retractor and operable to selectively lock the retractor against belt winding to hold the belt extended at a set length with respect to the occupant and unlock the retractor to permit belt winding, control means adapted to selectively operate the detent means between the locked and unlocked conditions, cam means associated with the retractor for selecitvely blocking operation of the detent means to the locked condition by the control means; and drive means for controlling the cam means in response to belt winding and unwinding, said cam means and said drive means cooperating throughout a plurality of belt unwinding reel revolutions to differentiate between an extent of belt unwinding indicative of disposition of the belt in the occupant restraining position and a greater extent of belt unwinding indicative of door opening movement and adapted to block operation of the detent means to the locked condition by the control means whenever the extent of belt unwinding is in excess of the extent indicative of disposition of the belt in the occupant restraining position.

4,241,939

SEATBELT SYSTEM

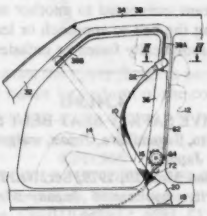
Ichiro Suzuki, Nagoya; Masanao Motonami, and Hisashi Ogawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1979, Ser. No. 37,158

Claims priority, application Japan, Dec. 21, 1978, 53-175579[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **10 Claims**



1. A seatbelt system for automatically fastening a belt about a passenger in a motor vehicle comprising:

a runner piece coupled to a passenger restraining belt;

a guide rail which guides said runner piece along the body of said vehicle;

a drive system for moving the runner piece along the guide rail and causing the belt to approach or move away from the passenger to automatically fasten or unfasten the belt about the passenger; and

slide shoes assembled separately onto and covering said runner piece in a space between the runner piece and the guide rail whereby the slide shoes minimize frictional resistance between the guide rail and the runner piece.

4,241,940

PASSIVE SEATBELT SYSTEM

Ichiro Suzuki, Nagoya; Hisashi Ogawa, and Masanao Motonami, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 6, 1979, Ser. No. 17,933

Claims priority, application Japan, Aug. 16, 1978, 53-112184[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **6 Claims**

1. A passive seatbelt device for a vehicle comprising:

a guide rail fastened longitudinally to a roof side of the vehicle, said guide rail being substantially straight;

a truck, movable along said guide rail, to which is fastened one end of a passenger-restrictive belt;

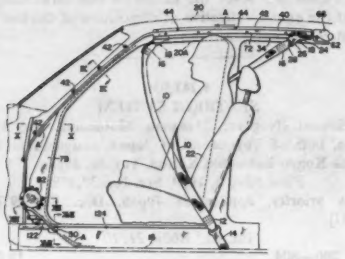
stoppers provided at a front and rear ends of said guide rail to restrict movement of said truck;

a slide rail provided separately from said guide rail, one end portion of said slide rail being fastened along said guide rail and the other end portion being fastened along a front pillar of the vehicle;

a flange extending from said guide rail;

a flange extending from said slide rail, said flange of said guide rail being fastened to said flange extending from said slide rail to thereby fasten the slide rail and guide rail in parallel together;

a flexible tape running in said slide rail, one end of said tape being fastened to said truck; and



a moving means connected to another end of said flexible tape causing the belt to approach or leave a passenger to thereby automatically fasten or unfasten the belt.

4,241,941

PASSIVE SAFETY SEAT BELT SYSTEM

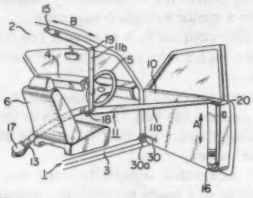
Kazuo Yamamoto, Sagamihara, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Mar. 19, 1979, Ser. No. 21,916

Claims priority, application Japan, Mar. 23, 1978, 53-36109[U]; May 12, 1978, 53-62663[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **8 Claims**



1. A passive safety seat belt system comprising:

at least one slide member being slidable in response to opening-closing of a vehicle door to change a condition of a belt engaged therewith in order to automatically restrain and liberate an occupant of a seat;

an elongated member having one end lying at a vehicle body part adjacent said door and the other end lying at a part of said door, one of said two ends being immovably attached and the other end being movable;

and link mechanism for amplifying and transmitting the motion of said movable end of said elongated member including

a first pivotally mounted lever,

a second pivotally mounted lever,

and a direction-changing arm, said first lever having a portion engaged with the movable end of said elongated member, a portion engageable with said direction-changing arm in an initial stage of the opening of said door, and a portion engageable with one end of said second lever during a stage subsequent to said initial stage of the opening of said door, and the other end of said second lever being pivotally connected to one end of said direction-changing arm, the other end of said direction-changing arm being pivotally connected to said slide member, the length between a center of pivotal rotation of said second lever and said other end of said second lever being greater than that between said center and said one end of said second lever.

4,241,942

SECURE CONTEST CARD

Gilbert Bachman, Atlanta, Ga., assignor to Dittler Brothers, Inc., Atlanta, Ga.

Continuation of Ser. No. 856,748, Dec. 2, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 51,377

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—6 **1 Claim**

1. A contest card for temporarily and completely concealing the presence, absence, position or nature of indicia printed on said card comprising a smooth surface card stock material having an upper surface and a lower surface, a patterned irregular layer of material printed on the upper surface of said card stock material, indicia printed on said patterned irregular layer, and a sectionally removable mask overlying said indicia, said mask being opaque with respect to visual examination but being sufficiently transparent with respect to photocopy examination to permit copying of information printed below the mask.

4,241,943

PARKING CARD

Raphael Malinovitz, Granby, Conn., assignor to Parking Control Systems, Granby, Conn.

Filed Oct. 6, 1978, Ser. No. 949,234

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—13 **11 Claims**

1. A parking card comprising a base surface area having a plurality of printed sections, one of said sections having a series of numbers corresponding to the maximum number of dates in a month and a second of said sections being printed with a series of spaced time indications indicating successive expiration times;

a friable removable coating placed over each of the date indicators and a friable removable coating placed over each of the expiration time indicators;

the removable coating over each date indicator being overprinted with dates corresponding to the dates beneath;

and the removable coating over the expiration time indicators being overprinted with a series of successive starting times at a selected time interval before the underprinted expiration time;

the removable coating being readily removable by the user to indicate a desired date and an actual parking time and an actual starting time;

such removable coating, when removed, revealing the underlying date and the underlying expiration time respectively.

4,241,944

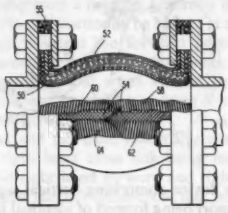
EXPANSION JOINT

Norman E. Clark, Canandaigua, N.Y., assignor to Garlock Inc., Longview, Tex.

Filed Dec. 6, 1977, Ser. No. 858,086

Int. Cl.³ F16L *51/02*

U.S. Cl. 285—229 **16 Claims**



1. A flexible expansion joint adapted to be secured between a pair of substantially rigid conduits and including first and second ends adapted to be received in sealing relationship with ones of said conduits and having an enlarged central section forming an arch, the walls of said arch extending radially at substantially less than 90° to the axis of the joint, the portion of said joint lying between said ends comprising an inner wall and an outer wall of elastomeric material, at least one support layer positioned intermediate said inner and outer walls and extending over the entire length of said joint between said first and second ends formed by a sheet of fabric oriented at a bias with respect to the axis of said joint, and at least one reinforcing layer positioned intermediate said inner and outer layers comprising a plurality of strands extending helically and continuously over substantially the entire length of the joint intermediate the ends thereof, such that no turns of any of said strands are disposed immediately adjacent other turns of the same strand.

4,241,945

MOTOR VEHICLE BUMPER

Guntram Huber, Aidlingen; Wolfgang Klie, Korntal; Wolfgang Fischer, Echterdingen; Daniel Riechers, Sindelfingen, and Hubert Hutai, Grafenau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

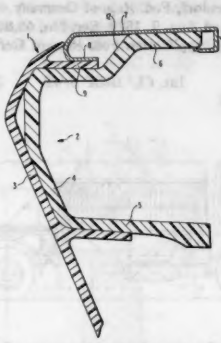
Filed Dec. 6, 1978, Ser. No. 966,865

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754868

Int. Cl.³ B60R *19/00*

U.S. Cl. 293—120 **12 Claims**

1. A motor vehicle bumper, comprising relatively elastic base body means of approximately U-shaped cross section, apron means formed of elastic plastic material which covers a forwardly disposed web of the base body means and is drawn about up to flanges adjoining the web on both sides, and cover means constructed as decorative strip and covering at least the remaining visible part of an upwardly disposed one of said flanges, characterized in that the cover means is pivotally connected with the base body means by fastening means disposed substantially in the axial direction of two bumper support means in a manner permitting relative vertical axis pivoting movement therebetween, and in that within the area of the



bumper support means, the upper flange is surrounded at the end face by clamp means formed out of the cover means.

4,241,946

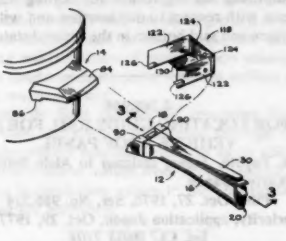
DETACHABLE HANDLE ASSEMBLY

Carl R. Spoeth, Jr., Kewaskum, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 780,936, Mar. 24, 1977, which is a continuation of Ser. No. 642,437, Dec. 19, 1975. This application Nov. 16, 1978, Ser. No. 961,309

Int. Cl.² A47J *45/07*

U.S. Cl. 294—31 R **7 Claims**



1. A detachable handle assembly for connection to a utensil side handle having a top side and an underside comprising:

a handle member having a connector end which includes two integral bifurcated upper extensions extending axially outwardly from said handle member each extension including under surfaces which match a corresponding top side surface of the utensil side handle and an integral lower extension having a terminal end which abuts against a corresponding portion of the utensil side handle underside when the handle assembly is engaged therewith, said handle member including an opposing outer end with an open channel along at least a major portion of the longitudinal axis thereof, with a rocker arm assembly pivotally connected proximate said outer end at a pivot portion thereof;

an insert positioned about within said channel and connected to said member, said insert having a pivot end and a terminal end;

a lever means affixed to said insert having first and second engagement portions, said first portion adapted to frictionally engage the utensil side handle underside and said second portion adapted to releasably engage said rocker arm assembly.

4,241,947

VEHICLE WITH TRANSFORMABLE LOADING AREA

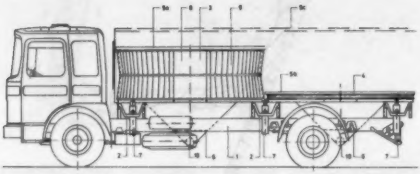
Georg Schröder, Schulstrasse 10, D-3588 Homberg, Bez. Kassel 1, Ortsteil Cassdorf, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,047

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836754

Int. Cl.³ B60P *3/42*

U.S. Cl. 296—10 **18 Claims**



1. In a vehicle for the selective transport of a piece load or a bulk load, having a container including a bottom constituting, at least in part, a funnel having a discharge opening, a top closure arranged above the bottom and collapsible side walls attached to the bottom and the top closure; and means for raising and lowering the top closure to place, respectively, the container in an erected position for receiving a bulk load and in a collapsed position for receiving a piece load on an upper face of the top closure; the improvement wherein said side walls comprise a plurality of relatively rigid side wall elements having, in a lowered position of said top closure, a collapsed state in which they are stacked with respect to one another between said top closure and said bottom and further having, in a raised position of said top closure, an erected state in which the side wall elements together contiguously form said side walls; further comprising sealing means for sealing adjoining side wall elements with respect to one another and with respect to said top closure and said bottom in the erected state of said side walls.

4,241,948

DEVICE FOR LOCATING GUIDE RAIL FOR SLIDABLE VEHICLE ROOF PANEL

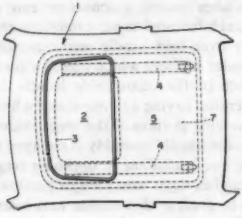
Keizi Mori, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 27, 1978, Ser. No. 955,214

Claims priority, application Japan, Oct. 29, 1977, 52/145268

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—216 **2 Claims**



1. Apparatus for positioning a guide rail adapted to support a slidable roof panel within a housing secured to a vehicle roof, comprising:

(a) a plate member secured to the guide rail and extending from one end thereof, said plate member having its free end tapered to a bayonet-point-like apex, with said apex being aligned substantially parallel to the centerline of said guide rail; and

(b) a clip member mounted through an opening in said housing and having a hole extending therethrough of substantially the same width and thickness as said plate member, said hole being adapted to receive said plate member for releasably securing said guide rail to said housing, said clip member having at least one inclined surface leading to said hole for guiding said tapered end of the plate member into said hole, and said clip member having at least one hook piece for engaging the edge of said opening.

4,241,949

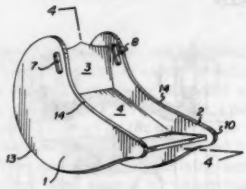
ROCKABLE FURNITURE

Michael S. Parker, Box 200, Sorrento, Me. 04677

Filed Sep. 20, 1978, Ser. No. 943,961

Int. Cl.³ A47C *3/029*

U.S. Cl. 297—3 **5 Claims**



1. A rockable device comprising vertical supports, the bottom of each support being formed of identical irregular curves made up of arcs of at least three different radii, the radius of the arc at one end being greater than the remaining arc radii, the greater radius arc of each said support bottom blending into a reverse curve section at one end thereof, means fastened to and spacing said supports, said last named means comprising a horizontal back section, a seat section angled upwardly therefrom at one end of the back section, and a slide angled from the opposite end of the back section whereby the device may be occupied and rocked through an arc of more than 120°, or alternatively turned over for use as a slide.

4,241,950

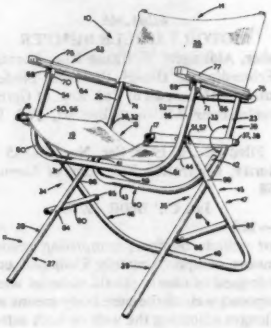
FOLDING CHAIR

Douglass E. Simpson, 2426 W. 6th Ave., Vancouver, B. C., Canada (V6K 1W3)

Filed May 4, 1979, Ser. No. 36,154

Int. Cl.² A47C *4/00*

U.S. Cl. 297—18 **11 Claims**



1. A folding chair structure having legs, a seat portion and a back portion; the structure being adapted to be unfolded from a folded position to an operative position in which the seat portion includes generally horizontal right hand and left hand

lateral seat members adapted to support seat material extending therebetween, and the back portion includes upwardly extending right hand and left hand lateral back members hinged to the respective seat members and adapted to support back material extending therebetween, the chair being characterized by:

(a) a forward leg pair having right hand and left hand inclined, generally parallel forward leg members extending upwardly and rearwardly from a position generally below a forward portion of the seat portion to be hinged at aligned rear hinge points generally adjacent a rear portion of the seat portion, the forward leg members extending essentially rigidly from the respective lateral back members adjacent the rear hinge point so as to be inclined at an obtuse angle to the back members to form right hand and left hand combination members, first transverse means connecting the combination members together,

(b) a rear leg pair having right hand and left hand inclined, generally parallel rear leg members extending upwardly and forwardly from a position generally beneath the rear portion of the seat portion to be hinged at aligned forward hinge points adjacent the forward portion of the seat portion, a second transverse means connecting the rear leg members together, and when viewed laterally, the forward and rear leg members appearing to cross each other at an intersection,

(c) right hand and left hand essentially non-resilient cross links, the right hand cross link being hinged to extend between the right hand forward and right hand rear leg members, and the left hand cross link hinged to extend between the left hand forward and left hand rear leg members respectively, the cross links being positioned below the intersection of the respective leg members, and sufficiently above lower portions of the leg members to permit the lower portions of forward and rear leg members to move laterally relative to each other.

(d) a forward arm support pair having generally parallel right hand and left hand forward arm support members hinged to the seat portion generally adjacent the forward hinge points to extend upwardly therefrom,

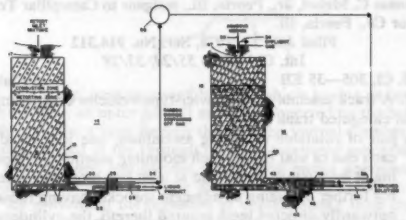
(e) an arm member pair having generally horizontal right hand and left hand arm members hinged adjacent forward portions thereof to the respective forward arm support members and adjacent rear portions thereof to the respective lateral back members.

4,241,951

RECOVERY OF MAGNESIA FROM OIL SHALE

Robert A. Hard, Laguna Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Feb. 21, 1979, Ser. No. 14,007
Int. Cl.³ E21C *41/10*; E21B *43/28*
U.S. Cl. 299—2 **42 Claims**



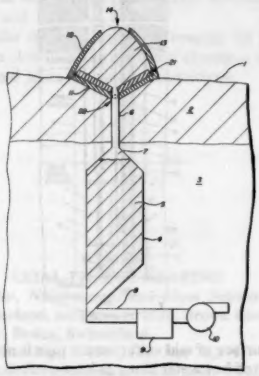
42. A method for leaching of magnesium values from combusted oil shale particles comprising the step of contacting combusted oil shale particles with an acidic aqueous leaching agent having a minor portion of a polyelectrolyte for forming enriched solution containing magnesium values.

4,241,952

SURFACE AND SUBSURFACE HYDROCARBON RECOVERY

Irwin Ginsburgh, Morton Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 6, 1979, Ser. No. 46,014
Int. Cl.³ E21C *41/10*
U.S. Cl. 299—2 **4 Claims**



1. An improved process for the recovery of hydrocarbon values from underground hydrocarbonaceous deposits comprising

forming an underground reaction zone containing a mass comprising rubblized hydrocarbonaceous material;

forming an essentially surface reaction zone containing a mass comprising rubblized hydrocarbonaceous material in fluid communication with the underground reaction zone;

forming an underground product collection zone for the gathering and collection of hydrocarbon values, said zone being in fluid communication with the surface and underground reaction zones;

passing suitable fluid capable of removing hydrocarbon values from the rubblized material through the surface and underground reaction zones so as to effectively remove hydrocarbon values from such material; and

passing the hydrocarbon values to the underground collection zone for recovery.

4,241,953

SULFUR MINE BLEEDWATER REUSE SYSTEM

Randol W. Bradford, Waggaman, and Michael H. Carmichael, Pearl River, both of La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,483
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—4 **17 Claims**

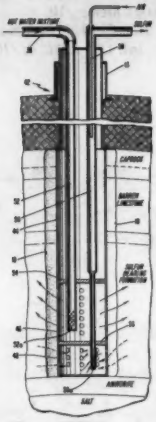
1. In a method of mining an underground sulfur ore body in a subterranean deposit wherein hot water at a sufficiently high temperature to liquefy sulfur underground is contacted with said underground sulfur which is liquefied thereby and which is thereafter moved to the surface whereby said hot water is somewhat reduced in temperature and accumulates as a body of underground water above at least a part of said sulfur ore body, that improvement utilizing the heat of said accumulated, underground hot water, comprising:

(a) removing at least a portion of said accumulated underground hot water from its subterranean location and bringing it above the ground surface;

(b) mixing said removed hot water with fresh hot water having a higher temperature than said removed water; and

(c) returning said mixed hot water to said underground sulfur ore body, so as to further liquefy said sulfur,

through a hot water downpipe physically separated from a sulfur return pipe through which the molten sulfur is withdrawn from said subterranean deposit such that the



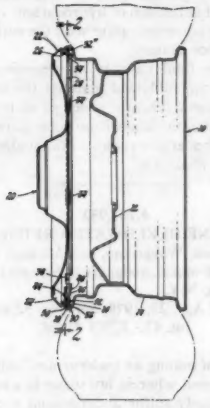
outer surface of said sulfur return pipe is not contacted by said mixed hot water along at least a substantial portion of the length of said sulfur return pipe.

4,241,954

WHEEL COVER RETENTION ARRANGEMENT

Trevor J. Brown, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1979, Ser. No. 84,512
Int. Cl.[3] B60B *7/00*
U.S. Cl. 301—37 R **4 Claims**



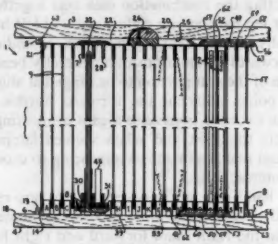
1. In combination with a vehicle wheel including an axially outwardly facing radially extending intermediate first annular flange merging into an axially extending radially inwardly facing second terminal flange, a wheel cover covering said wheel and having an outer annular peripheral portion including a radially extending axially inwardly facing first annular flange juxtaposed to the first wheel flange and merging into an axially extending radially outwardly facing second terminal flange juxtaposed to the second wheel flange, a pair of generally rigid semi-annular shoes, each including a plurality of wheel engaging projections, means mounting the shoes on the cover for movement between a first released position spaced radially of the second cover flange wherein the projections are out of engagement with the second wheel flange, and a second mounted position wherein the shoes radially engage the second cover flange and the projections engage the second wheel flange to float the cover on the wheel, means commonly biasing the shoes to the first released position, and means accessible from the outside of the cover peripheral portion for commonly moving the shoes to the second mounted position.

4,241,955

STORAGE RACK FOR RECORD ALBUMS

Hubert P. Armistead, 1204 Wilkes Blvd., Columbia, Mo. 65201

Filed Apr. 23, 1979, Ser. No. 32,356
Int. Cl.[3] A47F *1/04*
U.S. Cl. 312—12 **8 Claims**



1. A storage rack for articles such as phonograph albums and the like comprising:

(a) top and bottom walls having front and rear portions;

(b) means supporting said top wall in overlying relation to said bottom wall and spaced therefrom a distance not less than a height dimension of articles for insertion into the storage rack;

(c) a plurality of elongate, parallel vanes extending at least partially from said front to rear portions on at least one of said top and bottom walls and forming guide channels having a width dimension sufficient for receipt of at least one of the top and bottom margins of said articles, said vanes extending outwardly of at least one of said top and bottom walls a distance less than the distance between said top and bottom walls; and

(d) a plurality of elastic connectors extending between said bottom and top walls in generally parallel relation and defining resiliently flexible and expansible partitions forming side-by-side compartments sized for respectively receiving the articles therein.

4,241,956

TRACK ASSEMBLY FOR CRAWLER-TYPE VEHICLES

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 12, 1978, Ser. No. 914,312
Int. Cl.[2] B62D *55/24, 55/28*
U.S. Cl. 305—35 EB **3 Claims**

1. A track assembly for crawler-type vehicles comprising:

an elongated track frame;

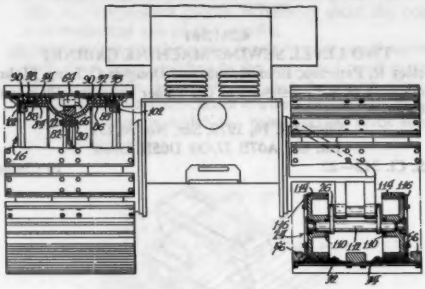
a pair of rotatable mounting assemblies, one journalled at each end of said frame, each mounting assembly comprising at least one cylinder and at least one mounting assembly further including an adjacent sprocket having radially outwardly directed teeth secured thereto, the cylinders of the two mounting assemblies being aligned;

an endless belt formed of a flexible, elastomeric material trained about said cylinders and mounting on one side a plurality of inwardly directed lugs, at least some of which are in engagement with said sprocket and on the other side inwardly directed guides, said guides extending inwardly

of the periphery of said cylinders adjacent the ends thereof remote from said sprocket;

a plurality of shoes on the outer face of said belt;

said lugs, cylinders and sprocket being constructed such that loading transmitted to said belt from said shoes will be



borne substantially entirely by said cylinders and not appreciably by said sprocket; and

a radially extending wear plate mounted on each of said remote ends of said cylinders for potential engagement with said guides.

4,241,957

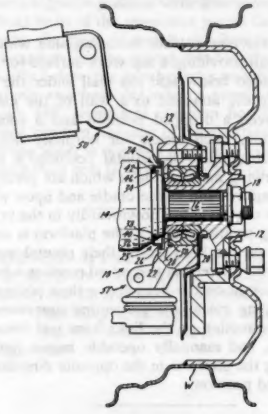
WHEEL BEARING SLINGER RING

Clifton S. Peck, Trenton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 26, 1978, Ser. No. 973,059

Int. Cl.³ F16C *33/78*

U.S. Cl. 308—36.4 **9 Claims**



1. In a wheel bearing assembly for a vehicle having an inner axle member, an outer journal member supported by the body of the vehicle, a bore formed through the journal member, a bearing carried in the through bore for rotatively supporting the axle member, and annular slinger ring means operatively carried intermediate said axle member and said journal member for preventing the ingestion of contaminating fluid from outside the assembly into the bearing, an improvement wherein said slinger means comprises:

A. means integrally formed with said journal member for defining an annular shoulder proximate the inner terminus of said through bore for preventing certain inward movement of said bearing;

B. means defining a counterbore in said journal member extending inwardly from said shoulder and substantially concentric with said through bore;

C. means defining an outer diameter surface on said axle member at an axial position proximately inboard said journal member counterbore; and

D. a generally cup-shaped annular slinger member carried for rotation with said axle member and including

1. an axially extending support portion received in interference fit relationship on said axle member diametral surface; and

2. an annular directly radially extending tip portion received in closely fitting diametral clearance relationship within said journal member counterbore.

4,241,958

AXIAL THRUST BEARING

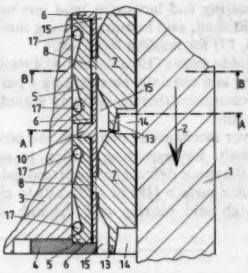
Wolfgang Möller, Nussbaumen, and Hans Schwarz, Umiken, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 7, 1979, Ser. No. 73,379

Claims priority, application Switzerland, Sep. 14, 1978, 9627/78

Int. Cl.³ F16C *17/06*

U.S. Cl. 308—160 **6 Claims**



1. A thrust bearing for axially supporting a rotary shaft, said thrust bearing comprising:

a plurality of bearing segments disposed circumferentially around said shaft for axially contacting a portion of said shaft, said segments including longitudinal support ribs;

a plurality of individual spring elements arranged circumferentially and disposed axially of said segments; and

a plurality of circumferentially arranged support plates disposed between said segments and said springs, said support plates including longitudinal bosses disposed circumferentially between said spring elements to locate said support plates relative to said spring elements in the circumferential direction;

said support ribs extending circumferentially between said support plates, so said support plates locate said segments in the circumferential direction;

said support ribs including tilt edges facing said spring elements and accommodating relative tilting movement therebetween so said spring elements elastically support said segments in the longitudinal direction;

said segments being spaced to form oil conducting passages therebetween, said segments including cooling ribs projecting into said passages.

4,241,959

APPARATUS FOR LONG-TERM LUBRICATION OF BEARING ELEMENTS

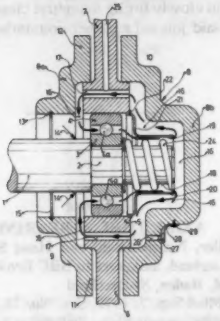
Manfred Frister, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,488

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804811

Int. Cl.³ F16C *33/66*

U.S. Cl. 308—187 **11 Claims**



1. An apparatus for providing long-term lubrication of a bearing, comprising

a bearing (**3**, **4**, **4*a***) for holding and locating a rotating shaft;

a housing formed by two concentric shells (**8*a***, **8*b***) surrounding said bearing and having at least one opening for receiving said shaft, said housing defining internal reservoir spaces (**16**, **17**) for holding lubricant;

a lubricant guide sleeve (**19**) attached to a stationary part of said bearing and coaxially surrounding a part of said shaft (**18**) with clearance, thereby defining a guide channel for said lubricant;

and a conveyor mechanism coupled to and powered by said rotating shaft, for imparting motion to said lubricant, located in the space defined between said guide sleeve (**19**) and the outer surface (**18**) of said shaft to circulate lubricant through said bearing and through said reservoir spaces.

4,241,960

SLIDE BUSHING FORMED OF FLAT SLIP STEEL BAND WITH ANTIFRICTION COATING

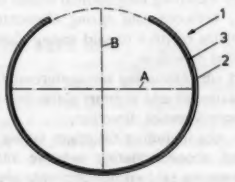
Georg Hentschel, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Industrial Trading & Development Co. B.V., Nieuwegein, Netherlands

Filed Nov. 17, 1976, Ser. No. 742,572

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 7537522[U]

Int. Cl.³ F16C *9/00*

U.S. Cl. 308—237 R **4 Claims**



1. In a slide bushing formed of a flat spring steel band having a coating of an antifriction material, and adapted to be sprung into a round housing bore, the improvement wherein said band has a wall thickness between 0.2 and 0.5 millimeters, said slide bushing having an elliptical shape with an axially extending slit when it is not installed in a housing bore, with the ratio between the major and minor axes thereof being substantially 1:0.9, the minor axis extending through the slit of the ellipse.

4,241,961

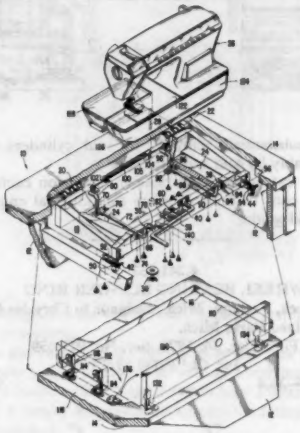
TWO LEVEL SEWING MACHINE CABINET

Wesley R. Peterson, Boundbrook, and Douglas C. Lang, Holmdel, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 16, 1979, Ser. No. 58,231

Int. Cl.³ A47B *51/00*; D05B *75/00*

U.S. Cl. 312—22 **10 Claims**



1. A sewing machine cabinet including side walls and an apertured top wall providing a top work surface for the cabinet, a cradle spaced below said top wall under the aperture thereof and hingedly attached to a wall of the cabinet for movement between a dropped position and a substantially horizontal position, latch means for normally holding the cradle in the substantially horizontal position, a mounting platform for a sewing machine, links which are pivotally connected to the platform and to the cradle and upon which the platform may be moved either downwardly in the cradle to a lowered working position wherein the platform is suspended from the cradle on the links below their pivotal axes in the cradle, or upwardly therefrom to a raised position wherein the platform is supported on the links above their pivotal axes in the cradle, stopping means for preventing movement of the platform in one direction on the links from said lowered suspended position, and manually operable means including a lever for moving the platform in the opposite direction on the links to the raised position.

4,241,962

STORAGE APPARATUS FOR RECORDS AND THE LIKE

Keith Ryan, Harrow, England, assignor to Recordex Limited, Tortola, British Virgin Isls.

Filed Sep. 13, 1978, Ser. No. 943,383

Claims priority, application United Kingdom, Sep. 16, 1977, 38737/77

Int. Cl.³ A47B *63/00*; A47F *5/12*

U.S. Cl. 312—183 **9 Claims**

1. Storage apparatus for visible index records, comprising

(a) a plurality of elongate panels of generally rectangular shape and having a front face and a rear face,

(b) a plurality of records,

(c) each said panel including means removably assembling a

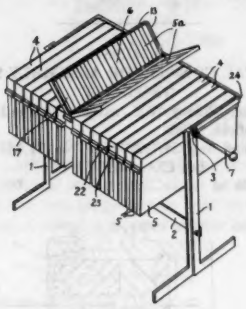
plurality of said records in overlapping array on the front face of the panel,

(d) a support means,

(e) a plurality of elongate panel-carriers,

(f) a spindle supported horizontally by said support means and supporting said panel-carriers in side-by-side relationship for independent pivotal movement about the common horizontal axis of said spindle,

(g) hinge means attaching two panels to each panel-carrier, each panel being attached to the associated panel-carrier by a longer side thereof for swinging movement relative to the associated panel-carrier in a direction at right angles to the direction in which the panel-carriers pivot about said common axis,



(h) said common axis being disposed approximately midway along the length of the longer sides of the panels which are attached to the panel-carrier, and

(i) said hinge means being so positioned and arranged that a pair of panels attached to a panel-carrier can be swung to a closed-together position with the records assembled to the front faces of the respective panels facing each other, whereby the pairs of panels attached to the respective panel-carriers can be stored side-by-side and suspended vertically below the panel-carrier to which they are respectively attached, and when a panel-carrier is pivoted through 180° about said common horizontal axis to an inverted position, the pair of panels attached thereto can be swung apart in opposite directions to an open position in which their rear faces are supported on other panel-carriers.

4,241,963

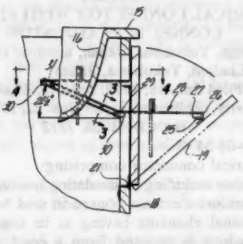
METHOD AND APPARATUS FOR UTILIZING VOID SPACES IN CABINETS AND THE LIKE

Charles Seidel, 436 Girard, Royal Oak, Mich. 48067

Filed May 7, 1979, Ser. No. 36,392

Int. Cl.³ A47B *88/00*; A47F *7/08*

U.S. Cl. 312—228 **17 Claims**



1. In combination, in a cabinet having side walls and a front wall having a normally fixed front panel, an apparatus for utilizing void spaces in cabinets and the like, including a front panel hingedly mounted to said front wall in place of said normally fixed front panel, a second hinge fixedly mounted near the top of said hingedly mounted front panel, a mounting block fixedly mounted to said second hinge, a shelf having a front portion and a rear portion with said front portion fixedly mounted to said mounting block and said rear portion having mounted thereon a pair of rear mounting blocks each having a pin extending laterally therefrom, a pair of C-shaped channels mounted in a 180° opposed relationship, one each to the inner surfaces of said side walls at an angle of approximately 22½° from the horizontal, and adapted to receive said pins to allow said shelf to move downwardly and outwardly while maintaining a usable horizontal position when said hingedly mounted front panel is opened.

4,241,964

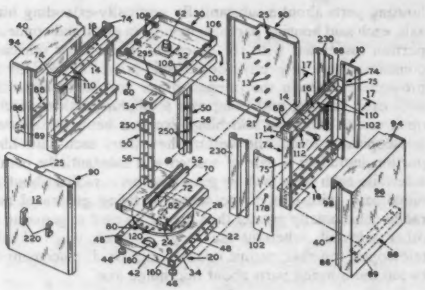
SINGLE OPEN FRAME FOR THE ROTOR OF A ROTARY STORAGE CABINET

Frederick H. Grubb, Jr., Stuarts Draft, Va., assignor to Acme Visible Records, Inc., Crozet, Va.

Filed Oct. 6, 1978, Ser. No. 949,262

Int. Cl.³ A47B *46/00*, *11/00*

U.S. Cl. 312—305 **3 Claims**



1. In a rotary storage cabinet having a stationary housing with openings in two opposite sides and a rotor mounted for rotation in said housing and wherein said rotor has four sides with two opposite sides positionable to present the contents of the cabinet to the openings in said housing and said rotor having two other opposite sides positionable to close the openings in said housing, the improvement comprising said rotor having a generally rectangular base, a generally rectangular top frame pan, and an open rectangular upright frame, said frame having a pair of spaced parallel uprights, a first cross piece extending between and secured to said uprights at their bottom ends, and a second cross piece extending between and secured to said uprights at their upper ends, said lower cross piece being releasably secured to said base, said upper cross piece being releasably secured to said upper frame pan, said rotor having only one of said open rectangular frames, and said one open rectangular frame being releasably secured by its cross pieces across the middle of said base and the middle of said top frame pan.

4,241,965

ELECTRICAL CONNECTOR FOR POWER PANEL SYSTEM

Harold R. Wilson, Holland Township, Ottawa County, and Ditmar K. Tillmann, Holland, both of Mich., assignors to Haworth Mfg., Inc., Holland, Mich.

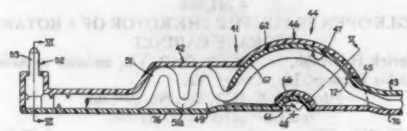
Filed Aug. 8, 1979, Ser. No. 64,956

Int. Cl.³ H01R *35/00*

U.S. Cl. 339—4 **10 Claims**

1. In a space-dividing wall structure formed from a plurality of prefabricated upright panels which are serially connected

together, said wall structure including a prewired electrical system associated therewith and extending longitudinally therealong, said electrical system including a pair of power blocks mounted on each panel adjacent the opposite vertical edges thereof and electrical cable means extending interiorly of each panel and connected between said pair of power blocks for defining an electrical circuit, said electrical system also including a hinged electrical connector releasably connected between the opposed power blocks of adjacent panels for electrically connecting the adjacent panels together so that the electrical circuit extends longitudinally throughout the plurality of serially-connected panels, said hinged electrical connector including a pair of rigid housing parts having integral hinge portions formed on the inner ends thereof and hingedly connected together for permitting relative swinging between said



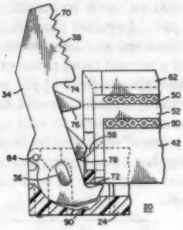
housing parts about a substantially vertically-extending hinge axis, each said housing part also having an electrical connector portion associated with the outer end thereof for releasable connection to a respective one of said power blocks, the improvement wherein the integral hinge portion as associated with each housing part comprises a tubular portion which is open at one end with said hinge portions being slidably and telescopically fitted one within the other, each said hinge portion including a pair of spaced and substantially parallel sidewalls each of which is generated on a radius about the hinge axis, with one of the sidewalls being generated on a radius substantially greater than the radius used to generate the other sidewall, whereby the hinge portions when slidably telescoped together permit relative angular displacement between the housing parts about said hinge axis.

4,241,966

CONNECTOR WITH EJECTOR-RETAINER MEANS

Jose J. Gomez, Los Angeles, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Apr. 26, 1979, Ser. No. 33,755
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—45 M **3 Claims**



1. Header-connector apparatus for terminating a multiconductor cable, comprising:

(a) a header having a plurality of electrically conductive pin members;

(b) a connector supported by said header and having electrical contacts for engagement individually with conductors of said cable and with said pin members, said connector defining a planar surface in facing relation to said header and having openings for passage of said pin members into said connector;

(c) a cover supported on said connector for retaining said cable therewith; and

(d) actuator means supported by said header for first and second respectively opposite sense movements,

(1) said actuator means having a first surface engageable with said connector in said first sense movement for affecting engagement of said pin members and said contacts,

(2) said actuator means having a second surface fixedly spaced with respect to said first surface and movable through the plane of said connector surface in said second sense movement for affecting separation of said pin members from such engagement with said contacts, and

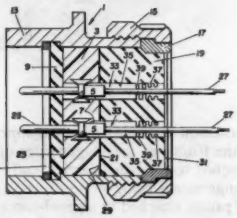
(3) said actuator means having a third surface movable into overlying relation to said cover in said first sense movement.

4,241,967

ELECTRICAL CONNECTOR ASSEMBLY SEALING GROMMET

Gordon T. Collins, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1979, Ser. No. 71,462
Int. Cl.³ H01R *13/48*
U.S. Cl. 339—59 M **5 Claims**



1. A sealing grommet for use in an electrical connector assembly wherein a plurality of electrical contacts are secured within axial bores formed in a dielectric insert, said grommet comprising a molded housing having an abutment face which is adapted to abut the insert, a plurality of axial passages extending through the housing to the abutment face cooperating with the axial bores of said insert, each of said axial passages having a circumferential wall and first and second pairs of resilient sealing webs integral with said housing and extending inwardly from the circumferential wall of each of said passages towards the axis thereof, said second pair of resilient sealing webs being situated between the first pair of resilient sealing webs and the abutment face of the grommet and extending inwardly from the circumferential wall towards the axis thereof a distance greater than said first pair of resilient sealing webs.

4,241,968

ELECTRICAL CONNECTOR WITH FLOATING CONNECTION ADJUSTOR

Yukio Fukunaga, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 18, 1979, Ser. No. 49,449
Claims priority, application Japan, Jun. 22, 1978, 53-85559[U]
Int. Cl.³ H05K *1/12*
U.S. Cl. 339—64 M **5 Claims**

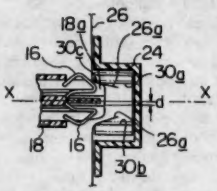
1. An electrical connector comprising:

a plug member including an insulating housing, and a plurality of terminal elements housed in said housing, each of said terminal elements having at its one end a mating section which is exposed from a head portion of said housing;

a socket member including a body having a recess to receive said head portion of said plug member, and a printed

wiring sheet attached to said body in a manner that a plurality of naked foil terminals of said sheet are enfolded into said recess; and

a separate equalizing float accommodated within said recess of said socket member with a play for floating sideway movement therewithin and having an opening with an inside dimension matching said head portion of said housing,



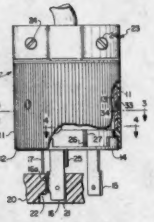
said head portion of the plug member being snugly inserted into said opening of said float, upon coupling of said plug member with said socket member, in a manner that the naked foil terminals are grippingly held between the mating sections of said plug member and the inner surface of said float.

4,241,969

LOCKING PLUG

Michael J. D'Amato, North Haven, and Frank C. Jaconette, Trumbull, both of Conn., assignors to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Sep. 18, 1979, Ser. No. 76,792
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—88 R **6 Claims**



1. A male electrical connector structure comprising

a generally cylindrical insulating body;

a plurality of locking blades supported in said body and extending from a front face thereof,

said blades being shaped and dimensioned for insertion into and translation in slots formed in a mating female connector structure as said body is moved axially and angularly, respectively;

a sleeve at least partially surrounding said body;

means for mounting said sleeve for limited rotation relative to said body between first and second positions and for restraining said sleeve against axial movement relative to said body;

an elongated locking member normally protruding from said front face of said body when said sleeve is in said first position; and

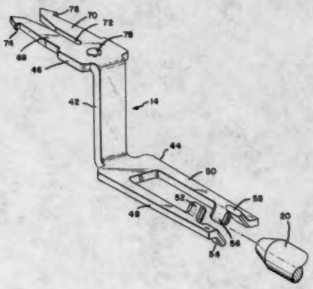
means on said sleeve for engaging said locking member and axially retracting said member into said body as said sleeve is rotated from said first position to said second position.

4,241,970

ELECTRICAL CONNECTOR HAVING IMPROVED RECEPTACLE TERMINAL

Clarence N. Rider, Jr., New Cumberland, and William J. Rudy, Jr., Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 9, 1979, Ser. No. 28,422
Int. Cl.³ H01R *11/12*
U.S. Cl. 339—99 R **10 Claims**



1. An electrical connector for interconnecting conductors of a multi-conductor cable to an array of terminal pins, said connector comprising:

a housing of insulative material having a mating front face and a rear face, a plurality of terminal passages extending between said faces, and latch projections extending from said rear face;

a like plurality of terminals each being formed of electrically conductive material with a body portion engaging said rear face, a mating terminal engaging first end extending into a respective passage in said housing, and a conductor engaging second end extending rearwardly from said rear face, said mating terminal engaging first end having a pair of parallel spaced arms each with at least one pair of tines directed toward the other of said arms, each tine of each pair being bent, with respect to the plane defined by said arms, in a direction opposite that of the other of said pair of tines and the opposing tine on the other of said arms, and said conductor engaging second end having a pair of tines defining a conductor engaging slot therebetween, each said tine having an insulation piercing profile on the free end thereof; and

a cover adapted to mate against said rear face, said cover having a cable slot extending therethrough in a first direction, latch slots extending through said cover in a second direction normal to said first direction and aligned to receive said latch projections therein, and terminal passages extending through said cover in said second direction and intersecting said cable slot whereby conductors of a cable positioned in said cable slot are terminated by said conductor engaging second ends of said terminals and mated with an array of pin terminals by said mating terminal engaging first ends.

4,241,971

PIGTAIL ASSEMBLY

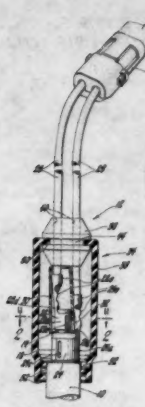
Robert D. Leonard, Jr., Poland, and Charles R. Nestor, Niles, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1979, Ser. No. 72,089
Int. Cl.³ H01R *13/44*
U.S. Cl. 339—116 C **4 Claims**

1. In a pigtail assembly adapted for attachment to a post terminal having longitudinally spaced ring contacts which includes an end connector having a plurality of insulated lead

wires extending therefrom and a terminal attached to the end of each insulated lead wire, the improvement comprising:

each of said terminals having a clip-like contact shaped for assembly to and retention on a respective one of the ring contacts, and



one of the insulated lead wires having an insulator sleeve slidably mounted thereon between the end connector and the terminal attached to its end,

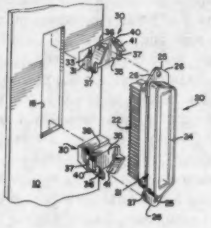
said insulator sleeve being slidable to a position over the terminal attached to the one lead wire and juxtaposed a portion of each remaining terminal for isolating the terminal attached to the one lead from each remaining terminal.

4,241,972

PANEL MOUNT FOR ELECTRICAL CONNECTOR

George E. Ayer, Naperville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 809,993, Jun. 27, 1977, abandoned.
This application Oct. 19, 1978, Ser. No. 952,762
Int. Cl.³ H01R *13/627*
U.S. Cl. 339—126 R **8 Claims**



1. An electrical connector assembly adapted to be mounted in an opening of an associated apertured panel board having inner and outer surfaces, said assembly including an electrical connector including a body portion adapted to extend partially through the aperture and a pair of outwardly extending mounting flanges at opposite ends of said body portion and a pair of connector clips for securing said electrical connector to the associated apertured support panel, each of said clips comprising:

a body member having first and second spaced surfaces disposed generally in facing relationship with each other to define a panel mounting slot;

said body member receivable in the aperture of the associated support panel with said support panel extending into said slot;

said body member having a mounting surface for receiving and holding one of said flanges on one end of said electrical connector;

a pair of spaced abutment shoulders projecting from said mounting surface and serving to limit movement of said electrical connector when a flange thereof is juxtaposed with said mounting surface and within the cavity defined by said abutment shoulders;

retaining fingers carried by said abutment shoulders for releasably securing said flange of said connector to said mounting surface, whereby, upon insertion of the pair of said clips into opposite ends of the aperture in said panel board and placing said body portion of said connector through the aperture, said body portion serves to retain said pair of clips in fixed position on the panel board while said mounting flanges of said connector are retained in position on said mounting surfaces so that said connector is fixedly secured to said clips; and

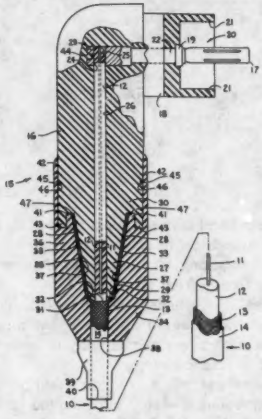
an abutment flange defining an abutment flange surface substantially parallel to said mounting surface of each said clip and adapted to extend into the aperture of the associated panel board to constrict the size of said aperture, and said connector body portion including a shoulder portion adapted to cooperate with said abutment flange to further hold said clips on the panel board and to further preclude movement of said connector relative to said panel.

4,241,973

COAXIAL CABLE TERMINAL CONNECTOR ESPECIALLY SUITABLE FOR HIGH-VOLTAGE, LOW-CURRENT ELECTROSTATIC USES AND METHOD OF MAKING SAME

Thomas A. Mayer, Allison Park, and James E. Sickles, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 4, 1978, Ser. No. 931,063
Int. Cl.³ H01R *11/11;* H02G *1/14*
U.S. Cl. 339—143 R **12 Claims**



1. A method for attaching a terminal connector to a cable of a type having a first conductor, an insulating material covering the first conductor, a braided seconsd conductor surrounding the insulated first conductor, and an insulating material covering the second conductor, to provide an assembly of a cable and connector terminal useful in high DC voltage, low current electrostatic applications operable in a range of from minimal voltage to about 25,000 volts, said method comprising the steps of:

(a) providing a terminal body fabricated of dielectric material having a head portion, a frusto-conically shaped tail portion, a passageway connecting the head and tail portions, and a high voltage contact element secured within the head portion across the passageway, the tail portion having a frusto-conically shaped tip, then narrower annular-shaped end of the tip defining an orifice in communication with the passageway, the orifice having a diameter sufficient to permit an insulated first conductor of a cable to enter the passageway but insufficient to permit the braided second conductor of the cable to enter the passageway;

(b) inserting the insulated first conductor of the cable into the passageway at the orifice in the terminal body tail portion;

(c) separating the braided second conductor of the cable from the insulated first conductor at the orifice of the passageway as the insulated first conductor passes through the orifice;

(d) flaring the braided second conductor of the cable outwardly along the side wall of the frusto-conically shaped tip in a direction away from the axis of the first conductor as the insulated first conductor passes through the orifice;

(e) providing a sheath of dielectric material having a cavity within which the terminal body tail portion is nested, the cavity having a tapering wall of a configuration complementary to the tapering wall of the terminal body tail portion; and

(f) securing the sheath of dielectric material on the terminal body so that the complementary fitting tapering walls coact to secure the termini of the separated and flared braided second conductor within the interface between the dielectric materials of the terminal body and the sheath to completely enclose the termini of the braided second conductor for electrical stress relief and to provide an electrically isolated termination for the braided second conductor.

7. A cable terminal connector for attachment to the terminus of a cable of a type having a first conductor, an insulating material covering the first conductor, a second conductor surrounding the insulated first conductor, and a second insulating material covering the second conductor, the terminal connector being operable in a range of from minimal DC voltage to about 25,000 volts in low current electrostatic applications to provide a high voltage connector for the first conductor and to provide an electrically floating termination for the second conductor, the connector comprising:

(a) a terminal body of dielectric material, said terminal body having a head portion, a tail portion and a passageway having an axis, said passageway connecting said head portion and said tail portion and adapted to receive a terminal portion of an insulated first conductor of a cable, and tail portion providing a wall sloping toward said head portion and away from said axis at an acute angle with said axis;

(b) a high voltage contact element having a first end secured within said terminal body and having a second end adapted to make electrical contact to another high voltage carrying element;

(c) means adapted to receive a terminus of a first conductor of a cable and to provide electrical connection between the conductor and said first end of said high voltage contact element;

(d) a sheath of dielectric material cooperating with said tail portion of said terminal body, said sheath having a cavity with a sloping wall, said tail portion of said terminal body being nested within said cavity so that said sloping wall of said tail portion and said sloping wall of said cavity form an interface adapted to receive at least a portion of a flared terminus of a second conductor of a cable between said sloping wall of said tail portion and said sloping wall of said cavity, said interface sloping outwardly and adapted to secure a flared terminus of a second conductor a radial distance outwardly from a first conductor that is substantially greater than the radial distance between the first conductor and the second conductor of an unflared portion of a cable, said interface being adapted to enclose the second conductor terminus within the dielectric materials of said terminal body and said sheath to provide mechanical and electrical stress relief.

4,241,974

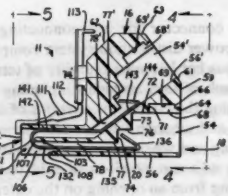
MULTI-OUTLET ADAPTER FOR MODULAR TELEPHONE CORDS

Edwin C. Hardesty, Perry Hall, Md., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 2, 1979, Ser. No. 35,174

Int. Cl.³ H01R *13/518*

U.S. Cl. 339—154 A **7 Claims**



1. An adapter for connecting electrically terminals in each of a plurality of modular plugs to external components in a jack, said adapter comprising:

a dielectric housing having a jack portion at one end and a plug portion at an opposite end, said jack portion including a plurality of superimposed, externally communicating cavities each of which is adapted to receive a modular plug that includes a plurality of spaced parallel terminals, each of said cavities including a plurality of wire-receiving channels with each channel in one of the cavities being associated and aligned with a channel in the other cavity, said plug portion adapted to be received in a jack and including a plurality of spaced wire-receiving channels each of which has an externally communicating portion and each of which is associated with and communicates with aligned wire-receiving channels in said cavities, said housing including a plurality of dielectrically isolated, superimposed passageways which communicate said channels of said plug with associated ones of said wire-receiving channels in each said cavity of said jack portion; and

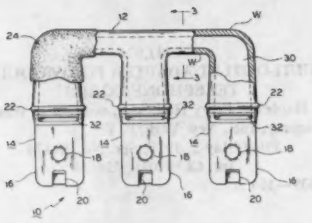
a wire-like, substantially uniplanar contact element mounted in each of said channels of said plug portion with a portion thereof being exposed in said externally communicating portion of each said channel in said plug portion to facilitate engagement with an external component in said jack when said plug portion is received in the jack, and having a retroflexed configuration with one free end portion of each contact element extending along an associated passageway of said housing into the associated channel in one of said cavities in said jack portion and the other free end extending along an aligned superimposed passageway into the associated, aligned channel in the other one of said superimposed cavities, said free end portions being exposed within said cavities and adapted to be engaged by said plug terminals when said plugs are received in said cavities, said portions of said contact element which extend along said passageways being separated and dielectrically isolated from each other.

4,241,975

CAST BUS BAR CONNECTOR HAVING HOLLOW CROSS-SECTIONAL AREA

James J. Cooper, Jr., St. Louis, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,739
Int. Cl.³ H01R 11/01
U.S. Cl. 339—242 2 Claims



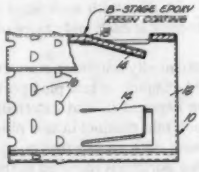
1. A bus bar connector for interconnecting the prepared cable ends of a power distribution system comprising an elongated common bus bar having a plurality of terminals extending therefrom each of said terminals including means for respectively fastening the conductor portions of said cable ends to said terminals and wherein said bus bar connector is formed as a hollow casting and wherein wall portions of said common bus bar and the adjacent portions of said terminals form a chamber extending from an opening on the external surface of at least one of said terminals and through said common bus bar.

4,241,976

CONTACT RETENTION CLIP AND METHOD OF INSERTING SAME IN AN INSULATOR

Leland W. Oliver; John R. Moore, both of Santa Ana; Peter S. Willcox, Costa Mesa; James L. von Harz, South Laguna, and Robert J. Trivison, Newport Beach, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 20, 1979, Ser. No. 59,311
Int. Cl.³ H01R 13/405
U.S. Cl. 339—278 D 9 Claims



1. A method of making an electrical connector assembly comprising the steps of:

providing a plastic body having a bore therein;

providing a contact retention clip having a resinous coating thereon, said plastic body and resinous coating have a chemical substituent in common;

inserting said clip in said bore; and

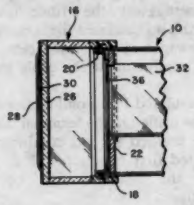
heating said coating on said clip to cause any cracks which may exist in said plastic body to become sealed by the coating.

4,241,977

AMUSEMENT DEVICE

Clifford Wood, Bob Hill Rd., Pound Ridge, N.Y. 10576

Filed Jul. 20, 1979, Ser. No. 59,208
Int. Cl.³ G02B 23/00
U.S. Cl. 350—4.1 10 Claims



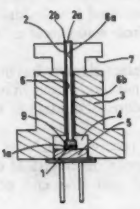
1. An amusement device including in combination a tube having a longitudinally extending side wall, a front wall at one end of the tube, a back wall at the other end of the tube, and an observation opening in the back wall for looking lengthwise into the tube, the front wall being substantially opaque over the area of the front wall that can be observed by looking through said opening in the back wall, reflecting surfaces within the tube and in angular relation to one another in planes normal to the direction of sight between said opening in the back wall and a partition located in the tube and spaced from the back and front walls of the tube and adjacent to the forward ends of the reflectors between the back and front walls, at least a portion of the tube between the front wall and said partition being made of light transmitting material and comprising a window near the front wall and in position to serve as a window to admit light from outside the tube in directions to illuminate the inside surface of the front wall as a target.

4,241,978

COUPLING DEVICE FOR CONNECTING A LIGHT SOURCE TO AN OPTICAL FIBER

Jean-Claude Dubois, and Gerard Mourgues, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,914
Claims priority, application France, Oct. 7, 1977, 77 30240
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 9 Claims



1. A coupling device for connecting a light source to a bundle of optical fibers, the light source having a light-emitting surface which emits light substantially in accordance with Lambert's law and which is mounted on a holder, said coupling device comprising:

a coupling rod which is formed by a part of an optical fiber having a circularly cylindrical core and cladding, the refractive index of the cladding being smaller than the refractive index of the core, said coupling rod forming an optical connection between the light source and the bundle of optical fibers to be connected to the device by

having a first end facing the light source and having a second end facing the bundle of fibers; wherein

the largest dimension of the source is at most equal to half the diameter of the core of the coupling rod; and

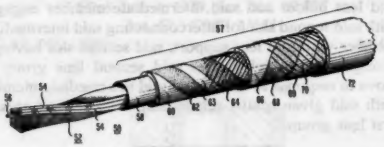
the source and the coupling rod are secured in a flexible, elastic support which maintains a distance between the light-emissive surface of the source and the first end of the coupling rod which is at most equal to one third of the diameter of the core of the coupling rod.

4,241,979

OPTICAL COMMUNICATION CABLE WITH MEANS FOR CONTROLLING COUPLING BETWEEN CABLE JACKET AND STRENGTH MEMBERS

Paul F. Gagen, Duluth, and Manuel R. Santana, Doraville, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 18, 1979, Ser. No. 4,342
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.23 **18 Claims**



14. An optical communication cable (50) having a longitudinal axis comprising:

a core (52) comprising at least one light transmitting optical fiber (56);

an inner tubular jacket (60) for loosely containing the core;

a first reinforcement bedding layer (62);

a first layer (64) of reinforcing strength members helically wrapped about the first reinforcement bedding layer to form an intimate surface interface;

a first outer jacket (66) made of plastic extrudant and coupled with the first layer of strength members;

a second reinforcement bedding layer (68);

a second layer (70) of reinforcing strength members helically wrapped about the second reinforcement bedding layer to form an intimate surface interface;

a second outer jacket (72) made of plastic extrudant and coupled with the second layer of strength members;

where the first and second layers of strength members are helically wrapped in opposite directions with predetermined lays such that under a tensile load each layer produces a substantially equal but oppositely directed torque with respect to the axis of the cable;

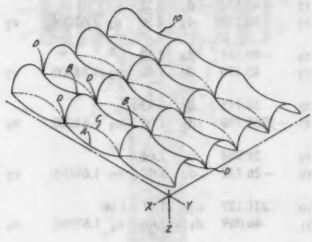
and where the bedding layers are each made of a material which is capable of registering the strength members as they are helically wrapped about the bedding layers to hold the strength members in regular intervals around the cable and which is substantially impervious to plastic extrudant and intimately interfaces with the strength members to form predetermined strength member surfaces (27) inaccessible to the outer-jacket plastic extrudant during cable manufacture, whereupon helically wrapping of each layer of strength members onto its associated bedding layer during cable manufacture, the associated bedding layer registers the associated strength members and renders their predetermined strength member surfaces sufficiently inaccessible to the outer-jacket plastic extrudant to prevent strength member encapsulation by plastic extrudant of the strength member lengths containing the predetermined strength member surfaces.

4,241,980

BEAM EMISSION CONTROL MEANS

Agis I. Mihalakis, deceased, late of San Luis Obispo County, Calif., and by Barbara L. Friend, legal representative, Cody, Wyo., assignors to William C. McGeehon, Canoga Park, Calif.

Filed May 24, 1978, Ser. No. 908,988
Int. Cl.³ G03B 21/60
U.S. Cl. 350—129 **26 Claims**



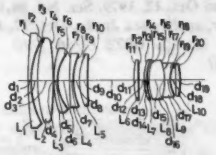
1. Apparatus having an improved gain characteristic for effecting control of beams emitted therefrom as a function of beams incident thereupon, comprising a plurality of similar units disposed in substantially contiguous relation, each unit including an emitting surface which is convex in a plane defined by first and second axes and concave in planes perpendicular thereto.

4,241,981

COMPACT WIDE ANGLE ZOOM LENS

Sadao Okudaira, Ranzanmachi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1979, Ser. No. 12,092
Claims priority, application Japan, Mar. 10, 1978, 53/27382
Int. Cl.³ G01B 15/16
U.S. Cl. 350—184 **2 Claims**



1. A compact wide angle zoom lens, comprising in order from the object side; a divergent front lens group and a convergent rear lens group, the overall focal length being variable by mechanical movement of the front and rear lens groups; said divergent front lens group being composed, in order from the object side, of a first lens being a negative meniscus lens convex toward the object side, a second lens being a double convex positive lens, a third lens being a negative meniscus lens convex toward the object side, a fourth lens being a negative lens and a fifth lens being a positive lens; said convergent rear lens group being composed of a sixth lens being a positive lens, a seventh lens being a positive meniscus lens convex toward the object, an eighth lens being a double convex positive lens, a ninth lens being a double concave negative lens, the eighth and ninth lenses being cemented to each other, and a tenth lens being positive lens, wherein the overall lens system composed of ten lens elements is grouped into nine lens components, the lens system satisfying the following conditions:

Resultant Focal Length
F = 24.7~48.5

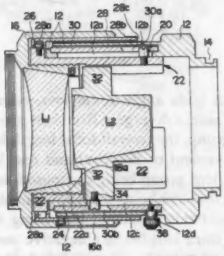
Lens		Radius of Curvature		Lens Thickness - Lens Space		Refractive Index		Abbe No.
L_1	r_1	279.684	d_1	1.50	n_1	1.88300	ν_1	40.8
	r_2	43.521	d_2	3.22				
L_2	r_3	90.739	d_3	7.30	n_2	1.62004	ν_2	36.3
	r_4	−99.547	d_4	0.10				
L_3	r_5	45.490	d_5	1.40	n_3	1.88300	ν_3	40.8
	r_6	18.175	d_6	5.93				
L_4	r_7	−1067.750	d_7	1.50	n_4	1.64000	ν_4	60.1
	r_8	28.948	d_8	2.66				
L_5	r_9	−26.732	d_9	3.91	n_5	1.69895	ν_5	30.1
	r_{10}	221.127	d_{10}	21.51~1.06				
L_6	r_{11}	46.089	d_{11}	2.46	n_6	1.67000	ν_6	57.4
	r_{12}	−162.341	d_{12}	2.40				
L_7	r_{13}	27.215	d_{13}	1.78	n_7	1.68250	ν_7	44.7
	r_{14}	39.045	d_{14}	0.10				
L_8	r_{15}	20.554	d_{15}	8.28	n_8	1.59551	ν_8	39.2
	r_{16}	−23.131	d_{16}	0.0				
L_9	r_{17}	−23.131	d_{17}	2.51	n_9	1.84666	ν_9	23.9
	r_{18}	17.116	d_{18}	2.30				
L_{10}	r_{19}	−193.791	d_{19}	2.29	n_{10}	1.71736	ν_{10}	29.5
	r_{20}	−22.084						

focal length, front group $f_F = -33.039$ focal length, second lens $f_2 = 77.700$

4,241,982
ZOOM LENS BARREL CAPABLE OF DIFFERENT DIRECTIONAL OPERATIONS

Kyozo Uesugi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 12, 1979, Ser. No. 84,130
Claims priority, application Japan, Oct. 27, 1978, 53/132800
Int. Cl.³ G02B *15/16, 7/10*
U.S. Cl. 350—187 **11 Claims**



1. A lens barrel for a zoom lens system which includes at least first and second lens groups and wherein zooming is effected by the movement of said first and second lens groups with a given spatial relationship therebetween, said lens barrel comprising:

a stationary barrel;

a first operable member supporting said first lens group and being mounted on said stationary barrel for at least axial movement relative thereto so as to effect corresponding movement of said first lens group;

an axially movable follower;

means interconnecting said first operable member and said follower with one another such that movement of said first operable member or said follower effects corresponding movement of the other;

an intermediate member mounted for rotation about the optical axis of said lens system;

means comprising a first slot in one of said intermediate member and said follower and a first pin on the other of said intermediate member and said follower engaged with said first slot for interconnecting said follower and said intermediate member together, said first slot having a configuration which causes said intermediate member to rotate in response to axial movement of said follower and which causes said follower to axially move in response to rotation of said intermediate member;

a second operable member mounted on said intermediate member for rotation therewith;

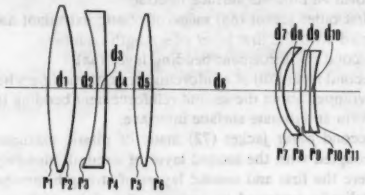
a lens holder for supporting said second lens group; and

means comprising a second slot in one of said lens holder and said intermediate member and a second pin on the other of said lens holder and said intermediate member engaged with said second slot for interconnecting said intermediate member with said lens support, said second slot having a configuration which causes said second lens group to move in response to rotation of said intermediate member with said given spatial relationship with respect to said first lens group.

4,241,983
TELEPHOTO LENS

Nozomu Kitagishi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 70,488
Claims priority, application Japan, Sep. 8, 1978, 53-111070
Int. Cl.³ G02B *9/60*
U.S. Cl. 350—216 **8 Claims**



1. A telephoto lens comprising:

a front lens group comprising a positive lens, a negative lens and positive lens arranged in the written order from the object side, and having a positve refracting power, and

a rear lens group arranged with a space from the front group, said positive lens being made of an anomalous dispersion optical material, and said negative lens being made of lanthanum glass,

said telephoto lens satisfying the following conditions:

$$0.9 < \frac{\phi_1}{\phi_3} < 1.2 \quad (1)$$

$$\frac{1.8}{F} < |\phi_2| < \frac{2.4}{F} \ (\phi_2 < 0) \quad (2)$$

$$\frac{1.8}{F} < \phi_3 < \frac{2.2}{F} \quad (3)$$

$$1.05 < \left|\frac{r_1}{r_2}\right| < 1.26 \ (r_2 < 0) \quad (4)$$

-continued

$$0.35 < \left|\frac{r_5}{r_6}\right| < 0.47 \ (r_6 < 0) \tag{5}$$

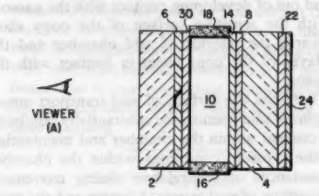
wherein F is the focal length of the whole system, ϕi is the refracting power of the i-th lens from the object side, and ri is the curvature radius of the i-th lens surface of the lens from the object side.

4,241,984

SIMPLIFIED FIELD EFFECT, TWISTED NEMATIC LIQUID CRYSTAL DISPLAY CONSTRUCTION

Marshall Leibowitz, Ridgefield, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 4, 1979, Ser. No. 45,576
Int. Cl.³ G02F 1/133
U.S. Cl. 350—337 **21 Claims**



1. In a liquid crystal display of the field effect, twisted nematic type, the improvement for simplifying the display construction comprising:

an untreated substrate and associated electrode layer having an untreated polarizer layer which inherently exhibits liquid crystal alignment-promoting characteristics positioned thereon in contact with the liquid crystal so that said polarizer layer serves the dual function of polarizing and liquid crystal alignment means in the display.

4,241,985

PANORAMIC CAMERA

Ronald P. Globus, 140 Fifth Ave., New York, N.Y. 10011; Richard D. Globus, 874 Broadway, New York, N.Y. 10003, and Stephen E. Globus, 899 Broadway, New York, N.Y. 10003

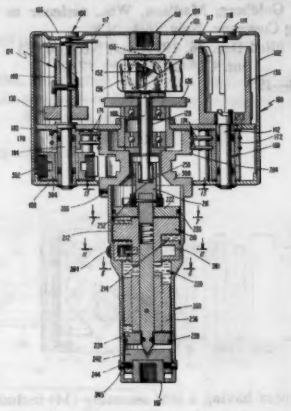
Filed Nov. 27, 1978, Ser. No. 963,739
Int. Cl.³ G03B 37/02, 17/02
U.S. Cl. 354—99 **32 Claims**

1. A panoramic camera, comprising:

a main camera portion;

a handle which is rotatably connected to the main camera portion; and

drive means for selectively rotating the main camera portion with respect to the handle including a ribbon spring and first and second spring spools, the ribbon spring being reversely wound on the first spring spool, said first spring spool being axially aligned with the handle and said second spring spool orbiting about said first spring spool



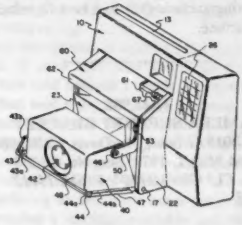
during said rotation of the main camera portion with respect to the handle.

4,241,986

FOLDING CAMERA

Kenneth W. Thomson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 10, 1979, Ser. No. 65,471
Int. Cl.³ G03B 17/04
U.S. Cl. 354—193 **22 Claims**



17. A folding camera comprising:

a housing for supporting photographic film for a photographic exposure;

lens supporting means hingedly supported to the housing and moveable between a storage position wherein the camera is folded and an exposure position wherein the camera is erected for making the exposure;

a cover hingedly supported to the housing for covering a portion of the lens supporting means when the latter is in its storage position and when the cover is in its home position;

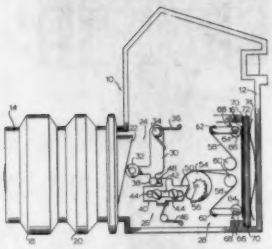
linkage means cooperating with the cover for supporting the lens supporting means in the exposure position, said linkage means interconnecting the lens support means and the cover such that lifting of the cover when the lens supporting means is either in its storage position or in its exposure position moves the lens supporting means in both instances to an intermediate position where gravity in cooperation with the orientation of the camera relative to gravity determines whether the lens supporting means will be moved to its storage position or to its exposure position in response to return movement of the door towards its home position.

4,241,987

APPARATUS FOR OPTIMIZING CAMERA IMAGE SURFACE TO IMAGE RECEIVING SURFACE

Norman N. Goldberg, Madison, Wis., assignor to Ziff-Davis Publishing Company, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,658
Int. Cl.³ G03B 3/00, 17/00
U.S. Cl. 354—195 28 Claims



1. In a camera having a lens assembly (14) including focus setting and aperture setting adjustment mechanisms (18, 20) and creating an image surface, and having an image receiving surface (16), apparatus for optimizing the image surface to the image receiving surface (16) comprising:

a detecting device (24) responsive to the settings of the focus setting and aperture setting adjustment mechanisms (18, 20) for instantaneously detecting the position of said settings;

a linkage (26) connected to the detecting device (24); and

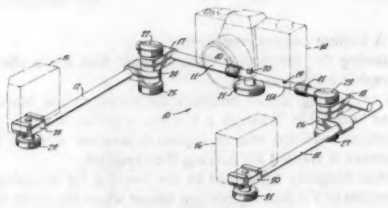
an image surface adjustment mechanism (28) operated by the linkage (26) to vary the position of the image receiving surface (16) relative to the lens assembly (14) to move the image receiving surface (16) to a best fit relationship with the image surface.

4,241,988

CAMERA SUPPORT BRACKET

George D. Lepp, 3015 Grinnel Pl., Davis, Calif. 95616

Filed May 1, 1979, Ser. No. 35,273
Int. Cl.³ G03B 17/00; F16M 11/12
U.S. Cl. 354—293 7 Claims



1. The photographic equipment mounting bracket comprising:

first, second and third rod members,

first clamp means associated with said first and second rod members,

second clamp means associated with said first and third rod members,

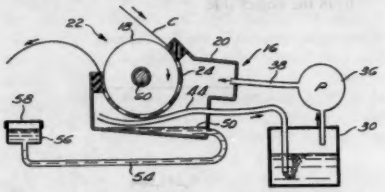
said clamp means arranged to permit linear positioning adjustment along the respective rod members relative to each other and to permit angular positioning of said second and third rod members relative to said first rod member.

4,241,989

DIAZO DEVELOPING APPARATUS

Richard W. Jackson, Barrington, and Terry G. Seelenbinder, Elk Grove Village, both of Ill., assignors to AM International, Inc., Los Angeles, Calif.

Filed Jan. 15, 1979, Ser. No. 3,202
Int. Cl.³ G03D 7/00
U.S. Cl. 354—299 8 Claims



1. Apparatus for developing diazo copy sheets comprising:

walls defining a developing chamber for containing gaseous ammonia; said chamber being provided with an opening at one side;

transport means in proximity to said opening generally providing a closure for the same, and active to move a copy sheet into and out of developing contact with the gaseous ammonia with the sensitive surface of the copy sheet directed towards the interior of said chamber and the supporting layer of the copy sheet in contact with the transport means;

sealing means between the surface of said transport means and the margins of said opening for substantially confining the gaseous content within the chamber and maintaining sustantially the pressure conditions within the chamber under circumstances of the relative sliding movement between the surface of said transport means and the margins of said opening to provide a substantially sealed development chamber; and

means for supplying ammonia gas to the chamber consisting essentially of:

a. a sealed reservoir for containing a liquid ammonia solution filling the container up to a level within a predetermined normal liquid level range,

b. a supply conduit leading from the upper portion of said reservoir above the normal liquid level range to said development chamber,

c. a pump in said supply conduit for moving the gas in said upper portion towards the development chamber, and

d. a return duct leading from the development chamber to a point in the reservoir beneath the normal liquid level range.

4,241,990

MULTI-PURPOSE OPTICAL DATA PROCESSOR

Tibor Fisli, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1979, Ser. No. 17,783
Int. Cl.³ G03G 15/00
U.S. Cl. 355—11 21 Claims

1. In a multi-purpose optical data processor for selectively performing light/lens xerographic copying and at least one laser scanning function, said optical data processor including

a transparent platen for supporting a subject in position to be scanned;

a xerographic processor including a photoreceptor which advances during operation in a cross scan direction through an exposure station; and

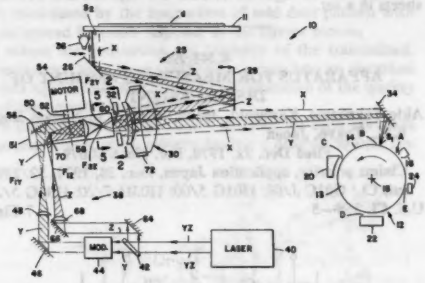
scan optics interposed between said platen and said exposure station for scanning said platen in said cross scan direction, said scan optics being elongated in an orthogonal line scanning direction to extend widthwise of said platen:

the improvement comprising

a selectively energizeable light source for illuminating said platen during light/lens copying;

a selectively energizeable laser for supplying a laser beam during laser scanning;

a beam scanning mechanism optically aligned with said laser for cyclically sweeping said laser beam through a predetermined scan angle in said line scanning direction; and



shared imaging optics including a half lens, said imaging optics being interposed between said scan optics and said exposure station for imaging said subject onto said photoreceptor in accordance with a line-by-line scanning pattern during light/lens copying and being optically aligned with said beam scanning mechanism for imaging said laser beam onto at least one of said platen and said photoreceptor in accordance with a raster scanning pattern during laser scanning.

4,241,991

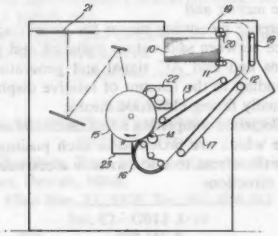
PHOTOCOPYING MACHINE

Ian G. Brown, Milton Keynes, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 21, 1979, Ser. No. 41,036

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—26 **1 Claim**



1. A copy machine having an original document exposure platen, a transfer station where images are transferred to copy sheets and a copy sheet feeding system, said sheet feeding system comprising:

an open, operator-accessible, combination buffer storage and a copy sheet discharge tray of unitary stationary configuration located adjacent the original document exposure platen,

a copy sheet supply tray,

sheet feeding means for feeding sheets from said supply tray to the transfer station,

second sheet feeding means for feeding sheets from the transfer station to said combination buffer and discharge tray; and,

third sheet feeding means for feeding sheets from said combination buffer and discharge tray to the transfer station.

4,241,992

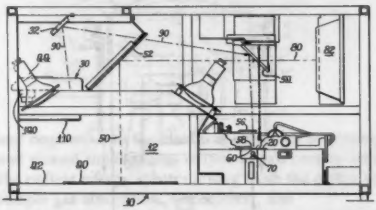
RECORDED IMAGE DETECTION SYSTEM FOR UPDATABLE MICROFILM

John R. Flint, Barrington, and Heinz Hertel, Mount Prospect, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 4, 1979, Ser. No. 81,972

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—41 **44 Claims**



1. An indicator mark generator and detector assembly for use with a photo-recorder for recording the image of a document selectively at one of a plurality of individual frames on a photo-recording medium upon a RECORD command, the generator-detector assembly operating selectively to cause the recording of an erasable indicator mark at a predetermined indicator mark field on said photo-recording medium signifying the recording of an image on said frame, and further operating to detect the presence or absence of an indicator mark in or from an image of said indicator mark field formed by cooperating means for projecting the image recorded at said indicator mark field along an optical path, said generator and detector assembly comprising:

sensor means interposed in said optical path responsive to the image of said indicator mark for exhibiting a first output when said indicator mark is present and a second output when said indicator mark is absent;

control means responsive to a selected one of said first and second outputs for preventing said recorder from recording said document image if said sensor means indicates the presence of said indicator mark;

means for defining an indicator mark-generating light beam and for forming a machine-readable and photo-recordable image in said light beam; and

means directing said indicator mark-generating light beam to said indicator mark field, said indicator mark field being positioned so that said recorder records said indicator mark thereon.

4,241,993

MOUNT FOR ORIGINALS IN PHOTOGRAPHIC DEVICES

Emile A. H. Guillaume, Ballaigues, Switzerland, assignor to Zelacolor Systems Establishment, Vaduz, Liechtenstein

Filed Apr. 2, 1979, Ser. No. 26,403

Claims priority, application Switzerland, Apr. 7, 1978, 3750/78

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—75 **11 Claims**

1. A mounting device for originals to be reproduced in photographic equipment, comprising:

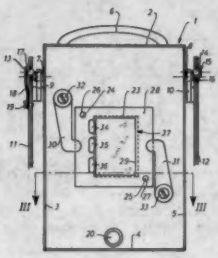
a first and a second frame; said frames being superimposed; each said frame having an exposure window, and said exposure windows being superimposed when said frames are superimposed; said superimposed frames being adapted to clamp between them the edge portions of an original to be exposed in said exposure windows;

a support for said frame;

fixing means for holding said frames to said support;

said first frame having opposite lateral sides; said fixing means comprising said first frame having a respective pin at each lateral side; each said pin having at least a segment thereof of circular cross-section;

said fixing means further comprising, on said support, a respective bearing part being provided for each said pin; each said bearing part including a generally V-shaped slot in said support, and each said pin segment being received in a respective said generally V-shaped slot therefor;



said fixing means further comprising spring means connected with said pins for firstly biasing said pins into the narrower ends of said generally V-shaped slots therefor and for secondly biasing said pins in a direction parallel to the axes of said pins;

an abutment on one said bearing part for opposing the second bias of said pins by said spring means, thereby for positioning said pins in a direction parallel to the axes of said pins.

4,241,994

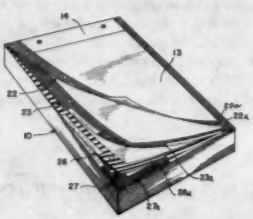
VISUALLY DESCRIPTIVE INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL SET

Le Roy J. Ryan, Jr., 1212 N. Lake Shore Dr., Chicago, Ill. 60610

Continuation of Ser. No. 483,634, Jun. 27, 1974, abandoned. This application Mar. 31, 1978, Ser. No. 892,104

Int. Cl.³ G03B *27/32*

U.S. Cl. 355—77 **5 Claims**



1. A method of making a preliminary reproduced visually descriptive information transmission, storage, and retrieval set which comprises placing in an image reproducing area of a copy machine, one of a plurality of overlay sheets having an image area centrally located on each sheet and a coding having a pattern, color, and saturation between the image area and at least one edge of said sheet, wherein the coding differs in at least one of pattern, color, and saturation on each sheet, placing a sheet of paper having printed indicia centrally located thereon in superposed position with said overlay sheet so that said printed indicia on said paper sheet appears within said image area of said overlay sheet, operating said copy machine with white copy paper sheets having a coding in color along at least one edge thereof to make a first reproduced paper sheet comprising the coding of said overlay sheet on said copy sheet located thereon between the image area and at least one edge of said sheet, and the printed indicia of said paper located within said image area, removing the overlay sheet and replacing it with another of the plurality of overlay sheets with different coding and repeating operation of the machine to obtain a next reproduced paper sheet having differing coding than said first reproduced sheet, and joining said reproduced sheets in a set.

4,241,995

APPARATUS FOR MEASURING AMOUNT OF DISPLACEMENT

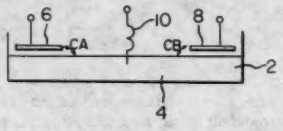
Akio Takahama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,079

Claims priority, application Japan, Dec. 28, 1977, 52/159450

Int. Cl.³ G01C *3/08*; H01G *5/00*; H03H *7/20*; H01G *5/16*

U.S. Cl. 356—5 **7 Claims**



1. Apparatus for measuring the amount of relative displacement between elements comprising:

fixed electrode means;

movable electrode means displaceable with respect to said fixed electrode means, said fixed electrode means and said movable electrode means being in mutually facing disposition;

a power source for generating an AC signal of a determined frequency;

phase-shifting means comprising a resistor and said mutually facing electrodes, said phase-shifting means being adapted to apply said AC signal to said mutually facing electrode means through said resistor and to generate an output signal the phase of which is shifted in response to the amount of relative displacement of said mutually facing electrode means; and

phase difference measuring means for measuring the phase difference between said output signal of said phase-shifting means and said AC signal and generating a signal corresponding to the amount of relative displacement of said mutually facing electrode means;

said fixed electrode comprising a first electrode and a second electrode which are provided in such positions that the distances therefrom to said movable electrode change in opposite directions.

4,241,996

APPARATUS FOR MEASURING THE QUALITY OF OPTICAL EQUIPMENT

Sidney Weiser, Silver Spring, Md., assignor to Exotech, Incorporated, Gaithersburg, Md.

Continuation-in-part of Ser. No. 747,739, Dec. 6, 1976, abandoned. This application Sep. 5, 1978, Ser. No. 939,490

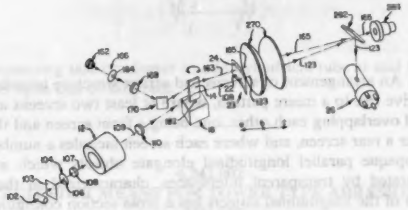
Int. Cl.³ G01B *9/00*

U.S. Cl. 356—124.5 **13 Claims**

1. In a system for determining the quality of optical equipment, apparatus comprising:

(a) an elongated, opaque reticle having a data pattern comprising at least one bar pattern of discrete spatial frequency, positioned longitudinally thereon, each discrete one of said patterns having optical transmission characteristics that vary periodically along its length according to a predetermined function;

(b) a mirror, said reticle being mounted stationary with respect to the mirror;
(c) source means for projecting light through optical equipment whose quality is to be determined to produce a spread function, and means for projecting the spread function response to said optical equipment onto said mirror to be reflected therefrom;
(d) means for moving said mirror to cause the spread function response reflected therefrom to sweep said data pattern so that the light transmitted through the data pattern is modulated by the interaction of said data pattern with the spread function response as the mirror moves;
(e) means for converting the intensity of the transmitted, modulated light from said source means into an electrical data signal, said data signal being indicative of the quality of the optical equipment;
(f) a clock pattern on said sheet member for each said data pattern, each clock pattern having a discrete spatial frequency which is a fixed multiple of the spatial frequency of a uniquely associated data pattern, said clock pattern having optical transmission characteristics that vary periodically along its length according to a predetermined function;



(g) a second slit image source means for projecting a second slit image from said second source onto said mirror so that said second slit image is reflected from said mirror onto said clock pattern, said means for moving said mirror causing said reflected second slit image to sweep said clock pattern so that the light transmitted through the clock pattern is modulated by the interaction of said clock pattern with the second slit image as the mirror moves;
(h) means for converting the intensity of the transmitted, modulated light from said second slit image into an electrical clock signal; and
(i) means for using said clock signal to sample said data signal at predetermined intervals.

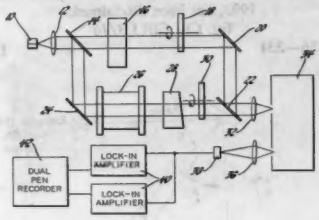
4,241,997

LASER SPECTROMETER WITH FREQUENCY CALIBRATION

Andrew R. Chraplyvy, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1978, Ser. No. 968,352
Int. Cl.³ G01J 3/34
U.S. Cl. 356—309 **1 Claim**

1. A laser spectrometer with frequency calibration comprising
a tunable diode laser emitting a beam of radiant energy comprising a plurality of frequencies corresponding to a plurality of laser cavity modes,
a beam splitter in the beam to produce first and second beam paths,
an etalon in the first beam path for generating frequency markers for spectrometer calibration,
a sample cell in the second beam path for containing a sample gas,
means for chopping the first and second beam paths at first and second frequencies, respectively,
a monochromator,
means for combining the radiant energy from the two paths into a single beam and passing it through the monochromator to isolate the frequency corresponding to a single laser cavity mode,
a single detector responsive to the single beam passed from the monochromator for generating an electrical signal analog of the single beam energy,
lock-in amplifiers tuned to the first and second frequencies



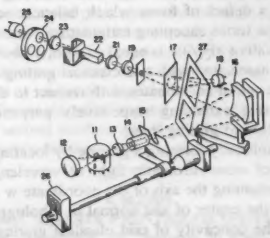
and responsive to the electrical signal for producing first and second simultaneous output signals corresponding to the radiant energy spectra arising from the etalon and the sample gas absorption, respectively, and
recording means responsive to the two output signals for simultaneously displaying the sample absorption spectra and the etalon fringe spectra.

4,241,998

SPECTROPHOTOMETER

Rudolf Farkas, Geneva; Michel Moulin, Lausanne, and Georges Revillet, Onex, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 18, 1979, Ser. No. 4,427
Claims priority, application Switzerland, Jan. 20, 1978, 621/78; Nov. 16, 1978, 11782/78
Int. Cl.³ G01J 3/42
U.S. Cl. 356—319 **9 Claims**



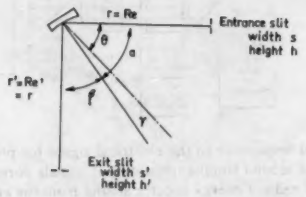
1. A spectrophotometer comprising:
(a) a flash tube,
(b) a stabilizing optical device for deriving from each flash from the flash tube a light beam having at the outlet of said device a spatial distribution which is substantially the same for every flash,
(c) a grating monochromator for dispersing the light delivered by the stabilizing device and for delivering a beam of filtered light,
(d) an optical element for driving the filtered beam to produce two beams, the first of which travels through a sample for analysis and the second of which reaches a detector which delivers a reference signal corresponding to the intensity of the second beam, and
(e) a second detector placed to receive the beam emerging from the sample.

4,241,999

MONOCHROMATORS

Michel Pouey, Viroflay, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 713,200, Aug. 10, 1976, abandoned.
This application Aug. 24, 1978, Ser. No. 936,592
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[3] G01J 3/18
U.S. Cl. 356—331 12 Claims



1. The method of making a monochromator using a concave, reflecting holographically formed diffraction grating, which comprises the steps of:

(a) determining the physical parameters of the monochromator by using a concave classical reflective diffraction grating having straight, parallel lines which are equidistantly spaced to provide a line density n, a height L_0 and a width W_0, the monochromator having fixed entrance and exit slits spaced from the grating to provide a predetermined magnification and a predetermined angle 2θ between the incident and diffracted beams, whereby the odd terms of the aberration wavefront is minimized, the grating being mounted for rotation only with respect to said slits whereby to scan a spectral range of interest, said physical parameters being the distances of said entrance and exit slits with respect to the intersection of their optical axes at the center of the reflective surface of said grating, and said physical parameters being selected to provide a defect of focus which balances second order aberration terms excepting astigmatism whereby the partial derivative $\partial F_1/\partial w$ is equal to zero, F_1 being the optical path associated with said classical grating and w and l being Cartesian coordinates with respect to the center of said grating extending respectively perpendicular and parallel to said grating lines;

(b) holographically forming a grating by locating two point sources of monochromatic light of wavelength λ_0 in a plane containing the axis of the coordinate w and passing through the center of and normal to a holographic blank having the concavity of said classical grating, such that said point sources are located by four position parameters which are the respective distances r_C and r_D of said point sources from said center of the holographic blank and the angle η and δ which lines from such point sources to said center respectively make with a line passing through such center and normal to said holographic blank; said four position parameters being established by four simultaneous equations the first of which defines the number n of grating lines holographically formed, the second of which defines astigmatic correction effected by the hologram provided by said point sources, the third of which defines coma correction effected by the hologram provided by said point sources, and the fourth of which defines the focussing condition in said plane effected by the hologram provided by said point sources; and

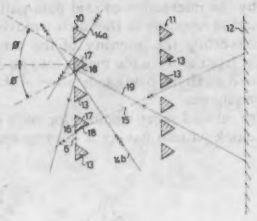
(c) substituting the holographically formed grating for said classical grating.

4,242,000

ARRANGEMENT AT SCREENS INTENDED TO GIVE RISE TO A MOIRE PATTERN

Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden

Filed Aug. 29, 1978, Ser. No. 937,785
Claims priority, application Sweden, Sep. 9, 1977, 7710139
Int. Cl.[3] G01B 11/14, 11/00, 9/02; G02B 5/18
U.S. Cl. 356—374 3 Claims



1. An arrangement of screens and screen structure intended to give rise to a moire pattern, where at least two screens are used overlapping each other, one being a front screen and the other a rear screen, and where each screen includes a number of opaque parallel longitudinal elongate objects which are separated by transparent interspaces, characterized in that: each of the longitudinal objects has a cross-section configuration providing means whereby light, incident from behind the screens, seen from the observer, viewing their front side is not reflected on said longitudinal objects in such a way, that the observer is subject to said reflected light, when the observer is within an angle sector (2ϕ) relative to the arrangement, within which sector the arrangement is intended to be used, where said cross-section (20) is inside defining lines (21, 22, 24, 25), which are constituted of two rear straight defining lines (21, 22) intersecting each other, seen from the observer, behind the line (23), which is the greatest width of the cross-section in the plane of the screens perpendicular to the longitudinal direction of the longitudinal objects, and of two forward straght lines (24, 25) intersecting each other, seen from the observer, in front of said line (23), where the rear respective lines (21, 22) run through the respective end points of said line of greatest width (23), forming an acute angle with said line or greatest width (23) corresponding to 90° minus half the angle (2ϕ) constituting said angle sector (2ϕ), and where the forward respective lines (24, 25) also run through the respective end points of said line of greatest width (23) and are tangent to the rear portion of the cross-section (20) of the respective adjacent longitudinal object.

4,242,001

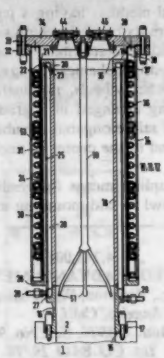
WORM EXTRUDER ASSEMBLY

Manfred Meintker, Erlangen; Anwer Puthawala, Buckenhof; Hans-Peter Schabert, Erlangen, and Erich Strickroth, Buckenhof, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 938,015
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1977, 2740490
Int. Cl.[2] B01F 15/06; G21F 9/02, 9/16
U.S. Cl. 366—75 9 Claims

1. Worm extruder assembly comprising an extruder worm, a steam dome formed as a cylindrical tube disposed transversely to the worm axis, said tube communicating at one end thereof with said extruder worm and being free and open at the other end thereof, a condenser surrounding said cylindrical tube, and

steam outlet means extending from said steam dome to said condenser, said steam outlet means defining an annular gap



connecting said condenser to said cylindrical tube at said free and open end of said tube.

4,242,002

AGITATOR MEANS FOR TOWER TYPE ABRASION MILLS

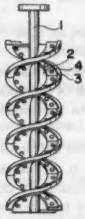
Shigekatsu Kawabata, 7-3, 1-chome, Bunkyo-ku, Tokyo, Japan

Filed May 7, 1979, Ser. No. 36,638

Claims priority, application Japan, May 22, 1978, 53-68950[U]

Int. Cl.³ B01F 7/24

U.S. Cl. 366—343 **6 Claims**



1. Agitator means, for tower type abrasion mills, comprising a continuous helical blade assembly, said helical blade assembly being composed of:

(i) a center shaft,

(ii) an inner helical blade of fixed pitch secured on the periphery of said center shaft

(iii) a segmental outer helical blade of the same pitch as said inner helical blade, said outer helical blade being composed of a plurality of outer blade segments placed end to end, said outer blade segments being secured removably on said inner helical blade, said segmental outer helical blade having an inner circumferential periphery spaced radially from and coaxial with said center shaft, said segmental outer helical blade having its external diameter greater than the external diameter of said inner helical blade, said segmental outer helical blade having its external circumferential periphery coaxial with said center shaft, each of said outer blade segments including a radially inner portion and a radially outer portion, said radially outer portion being relatively axially thicker than said radially inner portion, each of said outer blade segments having the same angular extent.

4,242,003

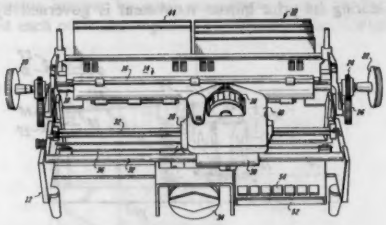
MULTI-PASS MATRIX PRINTING

Robert A. Ragen, Hayward, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 16, 1978, Ser. No. 952,040

Int. Cl.³ B41J 3/12

U.S. Cl. 400—124 **18 Claims**



1. In a printer including a record material movable past a printing station, and a print assembly capable of printing a line of characters in dot matrix format upon relative movement of said print assembly and said record material in a first direction, an apparatus for printing said line of characters comprising:

first means for effecting relative movement between said print assembly and said record material in said first direction at a first predetermined speed;

second means responsive to said relative movement in said first direction at said first predetermined speed for activating said print assembly to print during said relative movement a first predetermined number of dots of the dot matrix array defining each character in said line;

third means responsive to the printing of said first predetermined number of dots for effecting relative movement between said print assembly and said record material a predetermined amount in a second direction perpendicular to said first direction, and for effecting relative movement between said print assembly and said record material in a third direction opposite said first direction;

fourth means responsive to said relative movement in said second and third directions for effecting relative movement between said print assembly and said record material in said first direction at a second predetermined speed different than said first predetermined speed; and

fifth means responsive to said relative movement in said first direction at said second predetermined speed for activating said print assembly to print during said relative movement a second predetermined number of dots of the dot matrix array defining each character in said line.

4,242,004

DOT MATRIX PRINTHEAD DRIVER

Robert Adler, Northfield, Ill., assignor to Extel Corporation, Northbrook, Ill.

Filed Mar. 21, 1979, Ser. No. 22,412

Int. Cl.³ B41J 3/10

U.S. Cl. 400—124 **4 Claims**

1. A dot matrix printhead driver comprising:

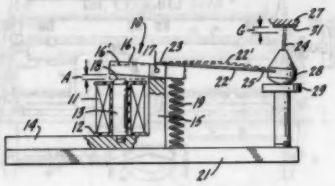
an electromagnet including a coil, circuit means for applying an energizing voltage to the coil, and a rigid clapper-type armature pivotally movable from a normal position to an actuated position in response to energization of the coil;

a print impact element, movable in a print impact movement from a rest position spaced from a platen to a terminal impact position engaging a record sheet of given thickness on the platen;

a cantilever leaf spring having one end affixed to the armature, the opposite free end of the leaf spring engaging the print impact element for moving the print impact element from its rest position toward its terminal impact position in

response to movement of the armature to its actuated position;

and inertial load means, aligned with and including the mass of the impact element, sufficient to maintain the impact element essentially in its rest position during a substantial portion of the movement of the armature to actuated position, so that acceleration of the print impact element during its print impact movement is governed by the



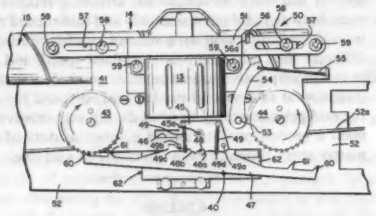
force/travel characteristic of the spring, the spring characteristic being selected so that the accelerating force passes through zero at an intermediate impact position spaced from the terminal impact position by at least one additional record sheet thickness and is negative between the intermediate and terminal impact positions, the major portion of the print impact movement of the impact element occurring after the armature reaches its actuated position.

4,242,005

INKED RIBBON ADVANCE AND REVERSE MECHANISM INCLUDING A PAWL HAVING DIFFERENT SIZE TEETH

Nicholas Kondur, Jr., Riverton, Wyo., assignor to C. Itoh Electronics, Inc., Los Angeles, Calif.

Filed Jun. 2, 1978, Ser. No. 912,090
Int. Cl.[3] B41J *33/40*
U.S. Cl. 400—220.1 **3 Claims**



1. An improved pawl for use in combination with an inked ribbon advance and reverse mechanism which includes:

a. a first ribbon spool from which an inked ribbon is unwound;

b. a first ratchet wheel having teeth disposed in a particular direction which is axially aligned with the first ribbon spool and which is rigidly coupled thereto so that the first ribbon spool and the first ratchet wheel rotate together;

c. a second ribbon spool onto which the inked ribbon is wound;

d. a second ratchet wheel having teeth disposed in the opposite direction of the teeth of the first ratchet wheel which is axially aligned with the second ribbon spool and which is rigidly coupled thereto so that the second ribbon spool and the second ratchet wheel rotate together;

e. mounting means for mounting said improved pawl so that said improved pawl may mechanically engage the teeth of one of the two ratchet wheels, said improved pawl comprising;

a. an elongated member having a pair of ends, each end having a plurality of teeth which are disposed along the surface of said elongated member and which are aligned so that the teeth mechanically engage the teeth of one of the two ratchet wheels, the teeth of said elongated member being arranged in a graduated series so that said teeth of said elongated member increase in height from each end to the center of said elongated member; and

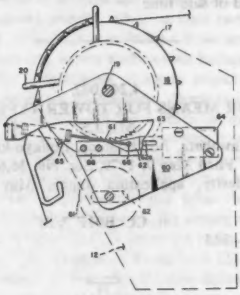
b. resilient coupling means for resiliently coupling said improved pawl to said mounting means.

4,242,006

ADJUSTABLE MEDIA ADVANCEMENT MECHANISM

Nicholas Kondur, Jr., Riverton, Wyo., assignor to C. Itoh Electronics, Inc., Los Angeles, Calif.

Filed Jun. 2, 1978, Ser. No. 912,089
Int. Cl.[3] B41J *19/76*
U.S. Cl. 400—568 **2 Claims**



1. Adjusting mechanism for use in combination with a media advancement mechanism of a printer to adjust the line position on a print media wherein the media advancement mechanism of the printer includes:

a. a frame having a first sidewall and a second sidewall;

b. a print head which is mechanically coupled to the frame;

c. a platen which is separately coupled to the frame so that the print media may pass between the print head and the platen;

d. a shaft which is rotatively coupled between the first and second sidewalls of the frame;

e. supporting means for supporting the print media which are rotatively coupled to the shaft and the rotational axis of which is parallel to the platen;

f. a ratchet wheel which has teeth and which is axially aligned with and mechanically coupled to the supporting means so that the ratchet wheel provides rotational motion thereto in order to move the print media incrementally in response to an electrical signal from the printer;

g. a solenoid which has an armature, the solenoid being rigidly coupled to said adjusting mechanism;

h. a pawl mechanically coupled to the armature of the solenoid and disposed so that the pawl can mechanically engage one of the teeth of the ratchet wheel in order to impart rotational motion thereto; and

i. a spring resiliently coupling the pawl to said adjusting mechanism, said adjusting mechanism comprising:

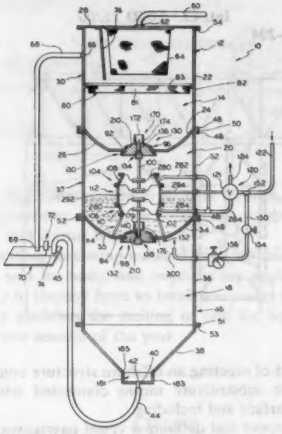
a. a plate member pivotally coupled to the shaft adjacent to the first sidewall of the frame wherein the solenoid is mounted on said plate member and the pawl is resiliently coupled to said plate member by the spring; and

b. restraining means for restraining said plate member from its pivotal motion.

4,242,007
METHOD AND APPARATUS FOR DISPENSING WELDING FLUX

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321, and John C. Colley, Schererville, Ind., assignors to Ralph Ogden, Munster, Ind., a part interest

Filed Apr. 30, 1979, Ser. No. 34,655
Int. Cl.³ B65G 53/36, 53/40
U.S. Cl. 406—109 6 Claims



3. A fluid cell for effecting linear movement of an actuator member to be so moved, said cell comprising:

diaphragm means anchored centrally thereof to the said actuator member to be actuated thereby,

and housing means in which said diaphragm means is mounted,

said diaphragm means defining rim portions anchored to said housing means in fluid tight sealing relation thereabout,

static seal means for effecting a fluid tight seal between said actuator member and said housing means,

said diaphragm means comprising:

a pair of diaphragms in spaced apart relation,

with one of the diaphragms comprising said static seal means,

and the other diaphragm being of larger area than said one diaphragm,

said diaphragms and said housing means defining one fluid pressure actuation chamber on one side of said other diaphragm,

enclosure means on the other side of said other diaphragm for defining a second fluid pressure actuation chamber,

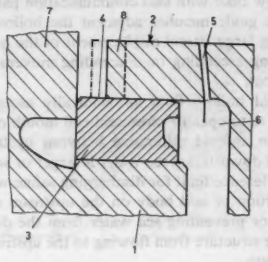
and means for alternately actuating and venting said chambers in oppositely acting relation for effecting linear movement of the actuator member, including conduit means for each said fluid pressure actuation chamber having connection to the space of same.

4,242,008
RIGID COUPLING

Felix Bernasconi, Zollikerberg, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 679,017, Apr. 21, 1976, abandoned.
This application Sep. 15, 1977, Ser. No. 833,687
Claims priority, application Switzerland, Jul. 4, 1975, 8728/75
Int. Cl.³ B25G 3/00
U.S. Cl. 403—13 6 Claims

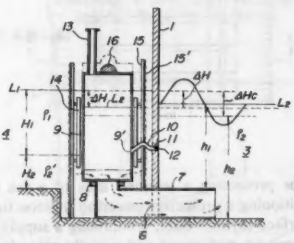
1. In a rigid coupling between adjoining shaft ends of the two rotor components of two machines, and wherein the end faces of said shaft ends are ultimately forced into frictional engagement to transmit bending, torsion and axial forces which arise in the coupling the improvement wherein for coupling and simultaneously centering said shaft ends, the shaft end of one of said machines is provided with an axially projecting boss, the shaft end of the other machine is provided with an axially extending recess for receiving said boss, and wherein a centering ring having a slightly frusto-conical centering surface is disposed between said boss and recess, the centering between said boss and recess being effected in a progressive manner by axial movement of said shaft ends toward each other accompanied by sliding frictional engagement between the frusto-conical surface of said ring and the adjoining surface on said boss or recess, the engagement between said ring and adjoining boss or recess serving also to transmit shear forces which arise in the coupling, the internal surface of said centering ring being secured to the surface of said boss and the slightly frusto-conical centering surface being formed on the external surface thereof and engaging the surface within said recess, the surface within the recess being cylindrical and the slightly frusto-conical centering surface being adjacent said cylindrical surface.



4,242,009
APPARATUS FOR AUTOMATICALLY AND SELECTIVELY DISCHARGING SALINE WATER

Isao Minami, Kyoto, Japan, assignor to Michio Okamoto, Kyoto, Japan

Filed Mar. 9, 1979, Ser. No. 19,170
Claims priority, application Japan, Jul. 11, 1978, 53/83519
Int. Cl.³ E02B 7/50
U.S. Cl. 405—93 8 Claims



1. An apparatus for automatically and selectively discharging saline water through a tide-preventing floodgate structure located between the ocean and a body of fresh water, said apparatus comprising:

a partition wall provided in said structure to separate fresh water upstream of said structure from sea water downstream of said structure,

a drain pipe in a lower part of said wall connecting upstream and downstream sides of said wall for discharging saline water from a lower portion of said body of water into the ocean,

means defining an upwardly open distal end mouth at one end of said drain pipe,

a hollow float positioned above said distal end mouth of the drain pipe for opening and closing said mouth, said float having an air duct at its top and an opening in a lower portion of said float,

means defining a communication path extending through a submerged portion of the partition wall between upstream and downstream sides of the structure,

a flexible communication pipe connecting said opening in said hollow float with said communication path, and

at least one guide member adjacent the hollow float for preventing large lateral displacement of the hollow float and guiding ascending or descending movements of the hollow float,

whereby said hollow float automatically ascends or descends so as to open or close said end mouth of the drain pipe when a level difference between upstream fresh water and downstream sea water is larger or smaller than a level difference limit for discharging saline water in the lower portion of said body on the upstream side of the structure or preventing sea water from the downstream side of the structure from flowing to the upstream side of the structure.

4,242,010

METHOD AND MEANS FOR PROTECTING A SEA BOTTOM SURFACE AND AN INSTALLATION ON SAME

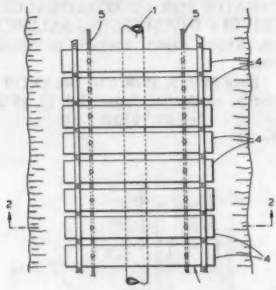
Trygve Gjerde, Jar, and Ronald Seim, Myrvoll, both of Norway, assignors to Ingenior F. Selmer AS; A/S Hoyer-Ellefsen and Ingenior Thor Furuholmen A/S, all of Oslo, Norway

Filed Aug. 14, 1978, Ser. No. 933,357

Claims priority, application Norway, Aug. 19, 1977, 772898; May 3, 1978, 781557

Int. Cl.³ F16L *57/00*

U.S. Cl. 405—157 **10 Claims**



1. Means for protecting a selected area of a sea bottom surface by positioning a protective covering thereon from and by use of a surface laying vessel, comprising a supply of primary wire means on said vessel and initially extending with one of its ends down to the sea bottom and anchored thereto, a supply of concrete plate elements on said vessel, secondary means for flexibly connecting together a group of said plates one after the other and thereby forming a series of flexible elongated mat-like units each including a certain number of said plate elements, means for attaching said mat-like units one after the other to said primary wire means synchronously with the moving and feeding of said primary wire means from the supply, the thereby formed continuous mat-like protective body being adapted to be lowered to the sea bottom surface and positioned thereon while simultaneously moving the vessel at suitable speed.

4,242,011

METHOD AND APPARATUS FOR FORMING INTEGRATED DECK SUB-STRUCTURE ASSEMBLY INCLUDING ARCH-VESSEL PASSAGE MEANS

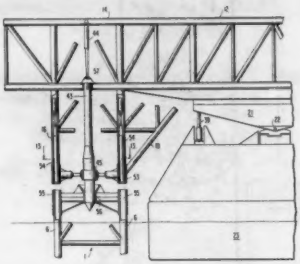
Demir I. Karsan; Graham J. Blight, both of Houston, Tex., and Larry E. Farmer, Claygate, England, assignors to Brown & Root, Inc., Houston, Tex.

Filed Mar. 28, 1979, Ser. No. 24,682

Claims priority, application United Kingdom, Apr. 3, 1978, 13000/78

Int. Cl.³ E02D *25/00*

U.S. Cl. 405—204 **5 Claims**



1. A method of erecting an offshore structure comprising:

transportable substructure means connected with a submerged surface and including

a slotted upper end defining a vessel passageway;

said method being characterized by:

providing integrated deck means operable

to be supported on vessel means for transportation to the vicinity of said substructure means, with said vessel means moving into said passageway so as to position said integrated deck means generally above said substructure means and in alignment therewith;

causing said vessel means to lower said integrated deck means onto the top of said substructure means and form said offshore structure; and

providing in said offshore structure, comprising said interconnected substructure means and integrated deck means, with

lateral force transmitting means

carried by one of said substructure means and said integrated deck means,

defining lateral force transmitting, arch-like means extending transversely from opposite sides of said vessel passageway, generally across at least side portions of said vessel passageway to an intermediate portion of one of said jacket means and integrated deck means, and

at least partially extending across said vessel means while said integrated deck means is supported thereon and said vessel means is in said passageway;

said lateral force transmitting means extending laterally beyond side portions of said vessel means, with outer portions thereof being disengaged therefrom when said integrated deck means is supported thereon, and said vessel means is disposed in said passageway.

4,242,012

METHOD FOR CONSTRUCTING A MULTISEASON ICE PLATFORM

Michael E. Utt, Placentia, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Mar. 14, 1979, Ser. No. 20,614

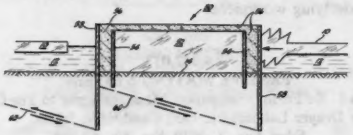
Int. Cl.² E02B *3/00*; E02D *29/02*; F25C *1/02*

U.S. Cl. 405—217 **15 Claims**

1. A method for constructing an ice platform at a cold offshore location having a sheet of ice floating on a water body

overlying a marine bottom, said method comprising the steps of:

(a) accumulating ice on the top surface of a selected portion of said ice sheet to thereby form an ice mass on said preselected portion, said ice being accumulated at least until the weight of said ice mass deforms said ice sheet and said selected portion of said ice sheet thereby becomes grounded on said marine bottom to form a grounded ice body comprised of said ice mass and said selected portion;



(b) driving a first rigid wall element through the ice around the perimeter of said ice body and a preselected distance into said marine bottom; and

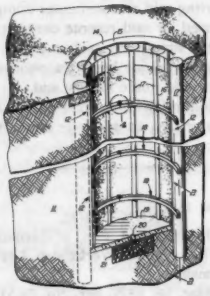
(c) installing insulating material between said wall element and said ice body, and over the top surface of said ice body to thereby form an insulation jacket which substantially prohibits the melting of said ice body during the warmer seasons of the year.

4,242,013

METHOD FOR FORMING A HOLE IN THE EARTH

James P. Watts, 6930 Pinchot Ave., Scottsdale, Ariz. 85251

Filed Jun. 4, 1979, Ser. No. 45,248
Int. Cl.[3] E02D *17/04, 29/02*
U.S. Cl. 405—272 3 Claims



1. An improved method of forming a hole in the earth, for preventing the side walls of the hole from collapsing inwardly during and after excavation of the hole and specially adapted for use in loose soils, said method comprising:

(a) drilling individual column holes in an essentially circular arrangement,

(b) filling said holes with concrete to the desired level so that columns are formed,

(c) supporting said columns with structural members defining a plurality of discrete planes positioned along the length of said columns, said structural members in each of said planes being generally concentric with the circle formed by said columns and in reaction to said inward compressive forces, being compressed between at least two columns, and

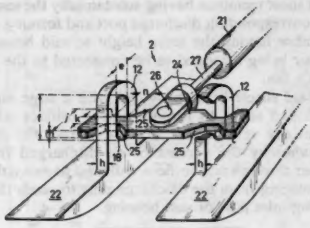
(d) excavating earth from within the perimeter of said columns.

4,242,014

PIVOT JOINT FOR UNDERGROUND MINING INSTALLATIONS

Lubomir Plevak, Lunen-Horstmar, and Jurgen Dodt, Menden, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jan. 30, 1979, Ser. No. 7,796
Claims priority, application Fed. Rep. of Germany, Feb. 30, 1978, 2803907
Int. Cl.[3] E21D *23/08*
U.S. Cl. 405—300 4 Claims



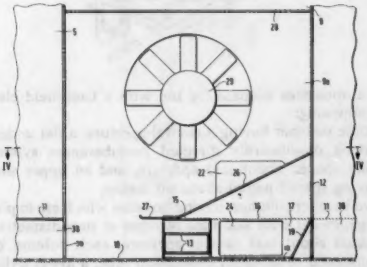
1. A releasable joint for pivotally connecting the piston rod of an advance ram to a floor sill of a mine roof support unit in an underground mining installation, the pivot joint comprising first and second connection members, the first connection member being connected to said piston rod and having a width which is greater than its thickness and a reduced portion that reduces its width to a core width, the second connection member being connected to said floor sill and being formed with a slot into which is inserted the reduced portion of the first connection member, the width of the slot being greater than the thickness and the core width of the first connection member, and the length of the slot being greater than the width of the first connection member, the thickness of the second connection member being smaller than the core width of the first connection member, and the width of the first connection member extending transversely of the length of the slot when said connection members are in the connection position.

4,242,015

APPARATUS FOR CONVEYING GRANULAR MATERIAL

Sven J. Persson, Surbrunnsgatan 4, 532 00 Skara, Sweden

Filed Jan. 8, 1979, Ser. No. 1,723
Int. Cl.[3] B65G *53/20, 53/44*
U.S. Cl. 406—82 7 Claims



1. Apparatus for the removal of granular material from containers of a storage plant, there being at least two containers or rows of containers separated by a space and each of said containers having a discharge port in a side wall thereof facing said space, the lower edges of said discharge ports being on a level with each other, said apparatus comprising

a conveyor arranged in said space in the middle between said containers or rows of containers, said conveyor having a material carrying member substantially on a level with or slightly below the lower edges of said discharge ports,

a tubular housing enclosing said conveyor having an upper, horizontal wall provided with inlet ports corresponding to the discharge ports of the containers and an outlet orifice for discharged material at the discharge end of the conveyor,

sheet members arranged to bridge the gaps between the lower edges of said discharge ports and the adjacent edges of said upper, horizontal wall of said tubular housing, each of said sheet members having substantially the same width as the corresponding discharge port and forming a roof of a chamber having the same height as said housing, said chamber being arranged to be connected to the pressure side of a fan,

each of said sheets being provided with a large number of slits shaped so as to provide upper orifices which are substantially vertical and face away from the discharge port, whereby the current of air discharged from said chamber through said orifices will tend to move the material emerging from the discharge port towards the corresponding inlet port of said housing.

4,242,016

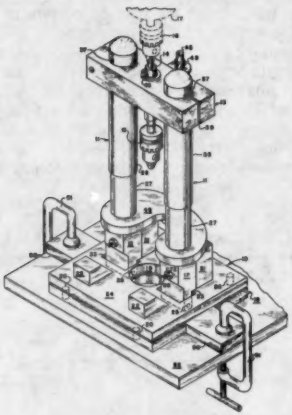
APPARATUS FOR GUIDING A HAND-HELD ELECTRIC DRILL

Bernard L. Faris, R.F.D. 1, Box 166, Glen Allen, Va. 23060

Filed Jan. 3, 1979, Ser. No. 727

Int. Cl.³ B23B 49/00

U.S. Cl. 408—14 **7 Claims**



1. An apparatus adapted for use with a hand-held electric drill comprising:

a. a base member having a central aperture, a flat underside having downwardly directed protuberances symmetrically spaced about said aperture, and an upper surface having spaced paired abutment means,

b. two parallel columns, having bottoms which are in pivotal engagement with said base member at sites diametrically spaced about said central aperture, each column being comprised of an upper cylindrical tube, a lower cylindrical tube which engages said upper tube in telescoping manner, and a coil spring confined within said engaged tubes and adapted to generate a resistive force when the upper tube is downly urged upon the lower tube,

c. a carriage in slideably adjustable engagement with said upper tubes, having a spindle centered between said columns and parallel thereto, the lower portion of said spindle supporting an adjustable chuck and the upper portion of said spindle being shaped to be gripped by an adjustable chuck, and

d. anchoring means having a flat upper surface and openings in said surface adapted to receive in close-fitting engagement the protuberances of said base member, a mating aperture positioned and dimensioned such that, when said anchoring means is engaged with said base member, the central appertures of both components are in substantially congruent relationship, and attachment means whereby said anchoring means may be adjustably fastened to an underlying workpiece.

4,242,017

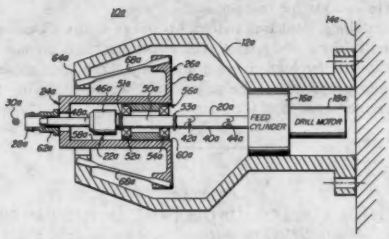
PASSIVE MATING SYSTEM

Thomas L. De Fazio, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 3, 1979, Ser. No. 63,184

Int. Cl.³ B23B 45/4

U.S. Cl. 408—111 **13 Claims**



1. A passive mating system for aligning and engaging a tool device with a workpiece, comprising:

a remote center compliance device;

means for supporting said remote center compliance device;

guide means carried by said remote center compliance device for movably supporting said tool device, said remote center compliance device having a remote center proximate the end of said guide means; and

means for providing relative motion between the tool device and said guide means to advance and retract said tool device.

4,242,018

BORING TOOL

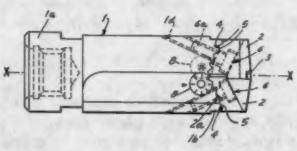
Horst Schürfeld, Bielefeld, Fed. Rep. of Germany, assignor to Gildemeister-Devlieg System-Werkzeuge GmbH, Bielefeld, Fed. Rep. of Germany

Filed Mar. 14, 1979, Ser. No. 20,519

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811965

Int. Cl.³ B23B 51/00

U.S. Cl. 408—182 **9 Claims**



1. A boring tool, comprising a rotary boring bar having a head, said head having a front face and means delimiting a recess in said front face, said delimiting means including a plurality of mutually inclined internal surfaces flaring frontwardly and outwardly from the axis of said bar and having

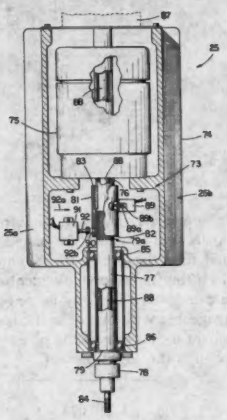
teeth extending transversely of said axis; a plurality of bit carriers each having a surface which is adjacent to one of said internal surfaces in said recess and is provided with teeth mating with the teeth of the respective internal surface, said carriers having elongated slots extending in substantial parallelism with the teeth of the respective internal surfaces; and securing elements extending through said slots and having threaded portions mating with tapped bores provided therefor in said bar, said elements being arranged to urge said carriers against the respective internal surfaces.

4,242,019

MILLING MACHINE

Gerald V. Roch, 8041 Fishback Rd., Indianapolis, Ind. 46268

Filed Feb. 23, 1978, Ser. No. 880,640
Int. Cl.³ B23C *5/26, 1/06*
U.S. Cl. 409—185 **22 Claims**



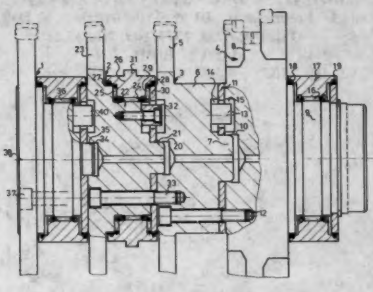
1. A milling machine comprising:
(a) a C-shaped frame having a base portion and an overhanging upper portion;
(b) a tool support member suspended from said overhanging upper portion and movable in a vertical direction;
(c) a saddle member supported by said base portion, positioned beneath said tool support member and movable in a transverse direction;
(d) a work table positioned atop said saddle member and movable in a longitudinal direction;
(e) a tool drive unit supported by and movable with said tool support member and including a drive motor having an output shaft extending therefrom and a rotatable tool spindle non-rotatably connected to said output shaft;
(f) a first plurality of recirculating anti-friction bearing ways having a common plane of vertical travel, said common plane being substantially coincident with the axis of rotation of said tool spindle, said ways being spaced about said tool support member and positioned between said C-shaped frame and said tool support member;
(g) each of said first plurality of bearing ways having a circulating track portion and an outer race portion;
(h) a second plurality of bearing ways located between said saddle member and said C-shaped frame;
(i) a third plurality of bearing ways located between said work table and said saddle member;
(j) a separate ball lead screw and DC motor combination associated with each of the three directions of movement and suitably arranged to control movement in each of the three directions; and
(k) said output shaft extends in a vertical direction and said tool spindle is hollow and coaxial with said output shaft.

4,242,020

MILLING TOOL, ESPECIALLY GANG CUTTER

Karlheinz Schmid, Neckartenzlingen, Fed. Rep. of Germany, assignor to Gebrueder Heller, Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 64,065
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1978, 2836395
Int. Cl.³ B23L *1/00*; B23B *5/18*; B26D *1/12*
U.S. Cl. 409—234 **9 Claims**



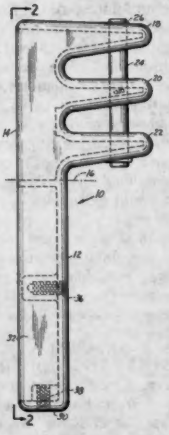
1. A gang cutter for crankshaft milling machines, comprising a plurality of partial units having a common rotational axis, each partial unit comprising a disk cutter, centrally arranged spacer means, and means securing adjacent units to each other so that the units are arranged in a row and centered relative to said common rotational axis, adjustment disk means operatively interposed between adjacent units, and wherein certain of said spacer means comprise bearing means for operatively supporting said gang cutter in said crankshaft milling machine.

4,242,021

REMOVABLY MOUNTED TRUCK BINDING POST

Glenn L. Sloane, 8825 Colbath, Panorama City, Calif. 91402

Filed Dec. 27, 1978, Ser. No. 973,604
Int. Cl.³ B60P *7/08*; B61D *45/00*; B65D *61/00*
U.S. Cl. 410—96 **8 Claims**



1. A binding post for trucks comprising;
a shaft having a shank and mast, said shank having an external regularly shaped surface that is insertable into a socket at one end and mounts the mast at the other end;

a plurality of pads extending outward from the mast portion of said shaft;

a tie pin passing through the ends of said pads to form at least one shackle; and

said shaft being a molded integral structure with a parting line below said mast, which mounts said pads, whereby the molded shank can have various molded lengths and shapes, with the same mast.

4,242,022

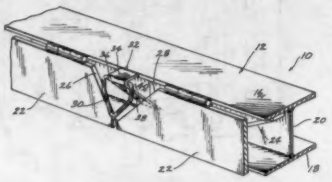
MOUNTING D-RINGS ON TRUCK TRAILERS

Ronald G. Fredrickson, 604 W. 11th, Mitchell, S. Dak. 57301

Filed Apr. 23, 1979, Ser. No. 32,148

Int. Cl.³ B60P *7/00*

U.S. Cl. 410—107 **9 Claims**



1. In combination,

a truck trailer comprising a wheeled frame means including at least a pair of laterally spaced apart and longitudinally extending outer side frame members; each of said frame members comprising an I-beam having horizontally disposed upper and lower flanges and a vertically disposed web extending therebetween, each of said upper flanges on said I-beams having an outer edge; and a deck means extending between the upper flanges on said I-beams,

a plurality of side extension members having inner and outer edge portions, and rearward and forward ends, said side extension members being hingedly secured at their inner edge portions to the outer edges of said upper flanges on said I-beams in adjacent relation, the adjacent rearward and forward ends of adjacent side extension members including at least outer portions thereof disposed in closely spaced relation,

said extension members being movable from a substantially vertically disposed folded position to a substantially horizontally disposed extension position,

a plurality of longitudinally spaced load restraining supports secured to each of said I-beams between at least some of the adjacent side extension members,

a load restraining ring means pivotally mounted on each of said supports and being pivotally movable from a substantially vertically disposed hanging position outwardly of said I-beam to an operative position whereby said ring means may be extended upwardly and inwardly from the outer edge of the upper flange of said I-beam,

at least one of the adjacent rearward and forward ends of adjacent side extension members including a cut-away portion formed therein to accommodate pivotal movement of said load restraining ring means between said hanging and operative positions.

4,242,023

SHEET POSITIONER

Leif Mohrsen, Surrey, Canada, assignor to Durad Machine Company, Ltd., New Westminster, Canada

Filed Apr. 16, 1979, Ser. No. 30,317

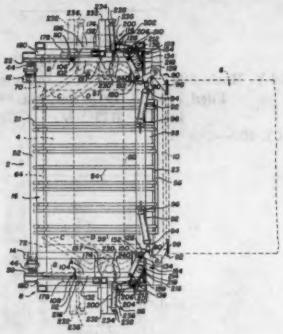
Int. Cl.³ B65G *65/02*

U.S. Cl. 414—36 **19 Claims**

1. An apparatus for loading panels into a hot press having a plurality of vertically spaced-apart openings for receiving the panels, the apparatus comprising:

a frame for locating near the openings of the press;

a tray carriage mounted on the frame for horizontal reciprocation towards and away from the press, the tray carriage comprising a plurlity of vertically spaced-apart horizontal trays for receiving the panels to be loaded into the press, each said tray having two sides, being aligned with one of the openings of the press and being movable into and out of the press with the reciprocation of the tray carriage; and



alignment means for vertically aligning front and back edges of the panels, and squaring the panels, before the panels are loaded into the press, the alignment means being mounted on the frame for movement towards and away from the press when the tray carriage is stationary and being engageable with one of said edges of the panels so the alignment means moves the panels along the trays to vertically align the edges thereof.

4,242,024

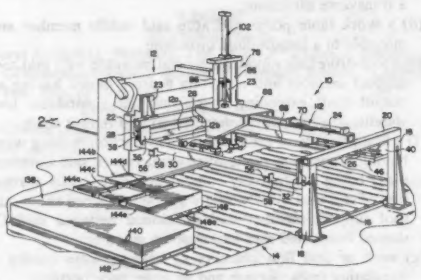
APPARATUS FOR PALLETIZING SHEET MATERIAL

John R. Buta, Salem; John H. Gehring, McDonald, and Thomas J. Drotleff, Salem, all of Ohio, assignors to Paxson Machine Company, Salem, Ohio

Filed Sep. 29, 1978, Ser. No. 946,741

Int. Cl.³ B65G *57/10*

U.S. Cl. 414—43 **22 Claims**



1. Apparatus for supporting a stack of sheets received from a source in a direction of discharge and transferring the stack to support means therefor comprising: a frame means including a vertically fixed horizontal frame portion overlying said support means in said direction and elevated with respect to said support means, fork lift means, means supporting said fork lift means on said frame portion for horizontal displacement between first and second positions in said direction and for vertical displacement between elevated and lowered positions rela-

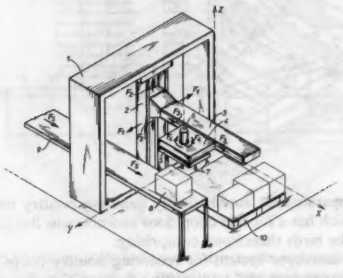
tive to said support means, said fork lift means in said elevated and first positions being positioned to receive sheet material from said source, and means to displace said fork lift means between said first and second positions and between said elevated and lowered positions.

4,242,025

PALETTIZING-DEPALETTIZING APPARATUS

Jacques G. A. Thibault, 35, rue Robert Legeay, 94000 Creteil, France

Filed Jul. 6, 1978, Ser. No. 922,418
Claims priority, application France, Jul. 8, 1977, 77 21226
Int. Cl.³ B65G *57/04*
U.S. Cl. 414—70 **4 Claims**



1. Apparatus for palettising or depalettising articles of parallelepipedic shape at the place or from the place corresponding to their position on the palette, said apparatus being of the crane hoist type and comprising in combination:

(a) a support having generally horizontal upper and lower surfaces;

(b) at least one vertically extending hoist pillar having upper and lower ends assembled on said support in horizontally slideable relationship with said upper and lower surfaces of said support;

(c) a hoist arm extending horizontally from said pillar in vertically slideable relationship therewith in a direction normal to the direction of movement of said pillar;

(d) a carriage extending from one side of said hoist arm in horizontally slideable relationship with said hoist arm;

(e) an article gripping head mounted on said carriage;

(f) means facilitating and ensuring rotation of said head with respect to said carriage; and

(g) means for effecting automation in operation of said apparatus.

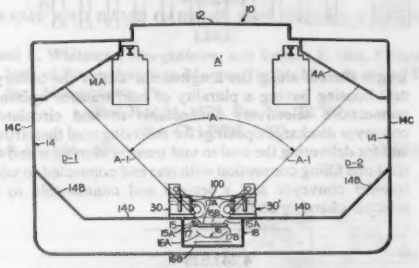
4,242,026

SELF-UNLOADING SHIP WITH SUSPENDED RECLAIM SCRAPER

Warren R. Vaughan, Markham, and Matthieu Suykens, Plainfield, both of Canada, assignors to Allis-Chalmers Canada, Limited, Lachine, Canada

Filed Sep. 5, 1978, Ser. No. 939,781
Int. Cl.³ B63B *27/20*
U.S. Cl. 414—145 **7 Claims**

1. In combination, a bulk cargo ship having a bulk cargo receiving region, said bulk cargo receiving region being separated into adjacent holds by a bulkhead extending transverse of the longitudinal axis of said holds, said bulkhead having an aperture through the upper portion of said bulkhead, a material handling system for continuous unloading of bulk cargo from said holds comprising an unloading conveyor positioned in underlying relation to said holds and adapted to move in a direction lengthwise of said holds, discharge passage means at the bottom of said holds through which bulk material may discharge onto said unloading conveyor, said material handling system further comprising means for reclaiming bulk material from said holds including a reclaim scraper comprising movable bulk material transfer means adapted to engage the bulk material and to transfer the bulk material to said discharge passage means, said reclaim scraper having a longitudinal dimension and a transverse dimension, with said longitudinal dimension being substantially greater than said transverse dimension, said longitudinal dimension being greater than the dimension of said aperture in said bulkhead, said transverse dimension being less than the dimension of said aperture in said bulkhead, said scraper when in normal operation being positioned with the longitudinal dimension thereof lying substantially transverse of the longitudinal axis of the plurality of holds and substantially parallel to the plane of said bulkhead, means for driving said movable bulk material transfer means to effect the transfer of said bulk material, track means mounted contiguous the upper end of said holds and extending longitudinally of said holds and through said aperture in said bulkhead, a trolley movable along said track means



lengthwise of said holds, a suspension head carried by said trolley, cable hoist means interconnecting said suspension head and said reclaim scraper and operable to lower said reclaim scraper into reclaiming relation to bulk material in the hold and for raising said reclaim scraper, said suspension head being mounted for rotation in a horizontal plane through a predetermined angle about a vertical axis while supporting said reclaim scraper, whereby to orient said reclaim scraper with the longitudinal dimension of said reclaim scraper substantially parallel to the longitudinal axis of the plurality of holds and thus properly positioned for passage through said aperture in said bulkhead, means supported by said trolley for rotating said suspension head through said predetermined angle, and means for moving said trolley along said track, whereby to move said reclaim scraper lengthwise of said hold in reclaiming relation to bulk material along the length of said hold, and whereby to move said reclaim scraper through said aperture in said bulkhead from one hold to an adjacent hold.

4,242,027

APPARATUS FOR CHARGING COKE OVEN FURNACES OF A COKE OVEN BATTERY

Josef Stratmann, Recklinghausen, and Willi Brinkmann, Herne, both of Fed. Rep. of Germany, assignors to Firma Carl Still, Recklinghausen, Fed. Rep. of Germany

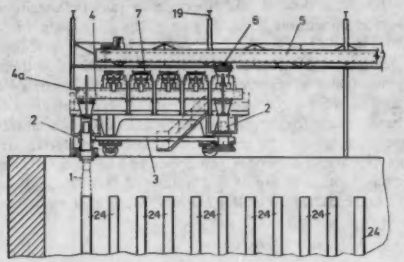
Filed Feb. 1, 1979, Ser. No. 8,270
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804825
Int. Cl.³ C10B *31/04*
U.S. Cl. 414—148 **9 Claims**

1. In combination, an improved coke oven charging device, for supplying coal to a plurality of charging chutes extending through a roof to each coke oven chamber of a battery of coke oven chambers successively arranged along a longitudinal horizontal axis of the battery, of the type having a circulator conveyor horizontally disposed in a spaced location above the roof and a coal charging car movable along the roof with

means for transfering coal between the circulator conveyor and the charging chutes, the improvement wherein

the circulator conveyor comprises an endless conveyor having a plurality of longitudinally and transversely spaced discharge openings, and

the coal charging car comprises a housing, a transfer conveyor mounted to said housing along at least a part of the



length thereof along the longitudinal axis of the battery, said housing having a plurality of coal transfer opening connections selectively connectable to said circulator conveyor discharge openings for receiving coal therefrom and for delivering the coal to said transfer conveyor and at least one filling connection with one end connected to said transfer conveyor and a second end connectable to a selected charging chute.

4,242,028

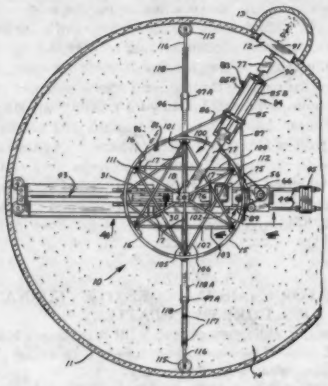
RING TYPE SILO UNLOADER

Frederick E. Van Dusen, Hopkins, Minn., assignor to Van Dusen & Co., Inc., Plymouth, Minn.

Continuation of Ser. No. 815,649, Jul. 14, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,198

Int. Cl.³ B65G *65/38*

U.S. Cl. 414—320 **29 Claims**



1. A silo unloader for use in an upright wall silo comprising an annular ring track means mounted within said silo, a silage gathering and discharge device, track engaging means to guide such silage gathering and discharge device for rotation relative to said track means while in engagement with silage in the silo, means to restrain said ring track means from rotation within said silo, and drive means to drive said silage gathering and discharge device rotationally around said track means, comprising power means mounted on said silage gathering and discharge device, an endless flexible member surrounding the outer surface of said ring track means, said power means including a rotationally driven member for engaging said endless flexible member, said rotationally driven member being positioned on the outside of said ring track means and driving said silage gathering and discharge device and said driven member around said ring track means.

4,242,029

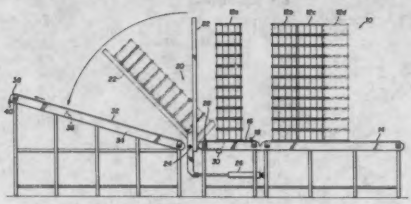
POULTRY COOP HANDLING SYSTEM

Harry J. Musgrave, P.O. Box 214, Nashville, Ark. 71852

Filed Jan. 31, 1977, Ser. No. 763,797

Int. Cl.³ B65B *21/02*

U.S. Cl. 414—413 **9 Claims**



1. An apparatus for automatically handling poultry coops, each of which has a topside coop door and contains live birds, to empty the birds therefrom, comprising:

an input conveyor system for receiving poultry coops in a tier arrangement and transporting the tier of coops along a defined path;

a lay down unit for receiving the tier of coops from said conveyor in an upright disposition and forwardly tilting the tier into an inclined disposition;

an inclined conveyor for receiving the tier of coops from said coop lay down unit in the inclined disposition in which each coop lays on its side, and for conveying each coop to the end of the conveyor where it falls over the end and is tilted further forward;

a saddle for catching each coop as it falls over the end of the conveyor and holding it in the forwardly tilted orientation such that the topside coop door freely opens to discharge the birds therefrom;

means for ejecting an empty coop from said saddle;

a conveyor for receiving an empty coop after it is ejected from the saddle, the conveyor being adapted to receive an empty coop in an upside down orientation and effect closure of the coop door by contacting the coop door as the coop is being received; and

a coop inverter for receiving a coop from said conveyor and turning the coop over to be topside up.

4,242,030

SELF-LOADING CAR-TOP CARRIER FOR WHEELCHAIRS OR SIMILAR SIZED LOADS

Clyde H. Clement, 8439 N. 13th Pl., Phoenix, Ariz. 85020

Filed Aug. 24, 1978, Ser. No. 936,235

Int. Cl.³ B60R *9/00*

U.S. Cl. 414—462 **1 Claim**

1. A self-loading, weather protected carrier for raising or lowering an object to and from the top of a motor vehicle and for transporting said object on said motor vehicle, said carrier comprising

(a) a horizontally disposed base adapted to be mounted on the roof of a motor vehicle and having transverse guide means affixed thereto,

(b) a carriage extendably carried by said transverse guide means and movable at a vehicle top level between a load-/unload position and a travel position,

(c) a generally L-shaped tilt frame, pivotally mounted on said carriage and rotatable between a generally upright position for loading and unloading said object and a gener-

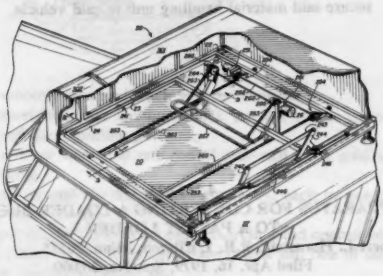
ally horizontal position for storing said object on said motor vehicle,

(d) linkage means, attached to said tilt frame and responsive to said carriage being extended into said load/unload position to rotate said tilt frame to said upright loading position, said linkage means including

(i) a thrust rod having one end pivotally attached to said tilt frame,

(ii) an upstanding tilt/thrust rail affixed to said base and having at least one inclined section,

(iii) a drive arm having a first end pivotally fastened to the other end of said thrust rod and a second end pivotally connected to said carriage, and



(iv) means, attached to said drive arm and contacting said tilt/thrust rail, for traveling along said rail and displacing said drive arm in response to the horizontal extension of said carriage into said load/unload position,

(e) attachment means for engaging said object,

(f) hoist means mounted on said tilt frame for

(i) suspending said engaging means from said carriage assembly so that said engaging means may receive at least a portion of said object, and

(ii) raising and lowering said engaging means and said object, and

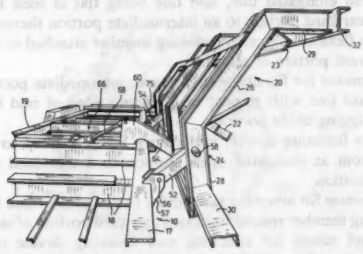
(g) means for extending said carriage.

4,242,031

SIDE LOADING AND UNLOADING TRAILER

Donald E. McMullen, 10 Elvins Gardens, Belleville, Ontario, K8P 2T3, Canada

Filed Oct. 16, 1978, Ser. No. 951,924
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—470 **7 Claims**



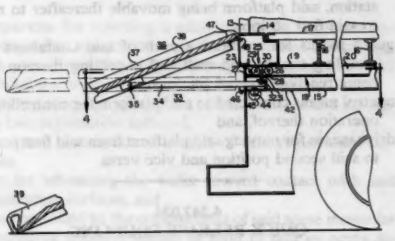
1. A side loading and unloading trailer comprising, in combination, an elongated trailer having a longitudinal frame and at least one transverse axle secured to said frame rotatably mounting vehicle wheels for transport of said trailer, said trailer frame including at least two longitudinal spaced-apart frame members and a plurality of cross frame members interconnecting the longitudinal frame members and rigidly secured thereto, an elongated load-supporting bed normally positioned on said frame, at least two spaced-apart links each pivotally mounted at one end on one side of said trailer frame and pivotally mounted at the other end to the corresponding side of said load supporting bed, an actuating member comprising a bent lever pivotally mounted at one end to form a fulcrum on one side of said trailer frame and pivotally mounted at the opposite end on the corresponding side of said load supporting bed, said pivotal linkages and said actuating mechanism mounted on the same side of said trailer frame and load supporting bed, and a piston-cylinder assembly pivotally mounted at one end on said trailer frame and pivotally mounted at the other end intermediate the ends of the bent lever whereby extension of the piston from the cylinder pivots the load supporting bed about the said links laterally outwardly from the side of said trailer frame and retraction of the piston into the cylinder pivots the load supporting bed about the links laterally inwardly onto the trailer frame.

4,242,032

RAMP AND RAMP CARRIER FOR TRUCKS AND THE LIKE

Paul L. Whiteman, Morgantown, and Vernon E. Orr, Elverson, both of Pa., assignors to Morgan Trailer Manufacturing Co., Inc., Morgantown, Pa.

Filed Jun. 21, 1979, Ser. No. 50,702
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—537 **9 Claims**



1. A ramp and ramp carrier for trucks and the like having a truck frame and a truck body thereon comprising

spaced longitudinally extending body frame rails,

transverse cross members carried on the upper extremities of said body frame rails,

a fixedly mounted track member centrally disposed between said body frame rails,

a trolley member movable along said track member,

a ramp carriage member movable between said body frame rails at its front end and carried by said trolley member and having rearwardly extending frame portions, and

a walk ramp movable between said body frame rails to positions for storage and for use and to which said rearwardly extending frame portions are hingedly connected intermediate the ends of the walk ramp.

4,242,033

MACHINE AND METHOD FOR VERTICAL TRANSPORTATION OF CONTAINERS

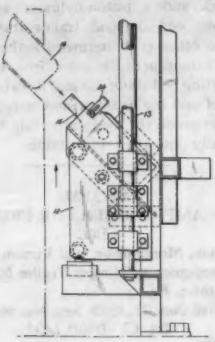
Stephen H. Aidlin, West Hempstead, and Michael Tartakowsky, Rego Park, both of N.Y., assignors to Aidlin Automation, Inc., Brooklyn, N.Y.

Filed Apr. 2, 1979, Ser. No. 25,891
Int. Cl.³ B65G *47/28, 47/52*
U.S. Cl. 414—662 **14 Claims**

1. A machine including a frame formed with a substantially vertically disposed wall, for cyclically receiving a plurality of containers from an unloading station, each container having a longitudinal axis, and for transporting them to a discharge

station, said discharge station being spaced apart from, and above said unloading station by a predetermined distance, comprising in combination:

a platform connected to said frame, being operable in a first position thereof below said unloading station for accepting said containers, so that the longitudinal axis of each container subtends a predetermined angle with the horizontal, said platform being movable thereafter to a second position spaced substantially vertically above said first



position for unloading said containers to said discharge station, said platform being movable thereafter to return to said first position,

guard means for restraining each of said containers from tumbling against said wall and impacting thereon when being received by said platform,

control means connected to said platform for controlling the operation thereof, and

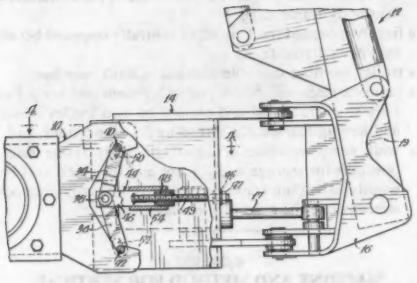
drive means for moving said platform from said first position to said second position and vice versa.

4,242,034

QUICK-RELEASE COUPLING

Floyd A. Schmitz, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 16, 1978, Ser. No. 961,105
Int. Cl.³ E02F 3/81
U.S. Cl. 414—686 **9 Claims**



1. A quick-release coupling between a vehicle and a material handling unit supported on the vehicle, comprising:

a rigid support frame carried by said vehicle and having a pair of opposed recesses the centers of which are spaced apart by a first distance,

linkage means connected to said material handling unit, said linkage means including first and second links pivotally interconnected at one end,

first means associated with the opposite end of said first link which is receivable in one of said recesses, and second means associated with the opposite end of said second link which is receivable in the other of said recesses, the sum of the length of said first link, as measured between said first means and the pivotal connection joining said links, and the length of said second link, as measured between said second means and said pivotal connection, being greater than said first distance,

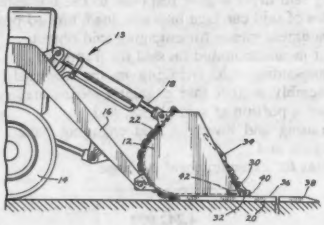
means, secured to said unit and operably associated with said first and second links, for moving said links between a first clearance position in which at least one of said first and second means is outside said recesses, and a second engaged position in which said first means and said second means are received in the respective recesses to releasably secure said material handling unit to said vehicle.

4,242,035

APPARATUS FOR CONVERTING A LOADER BUCKET TO A PALLET LOADER

Robert L. Hornstein, R.R. 1, Clinton, Minn. 56225

Filed Apr. 16, 1979, Ser. No. 30,000
Int. Cl.³ B66F 9/12
U.S. Cl. 414—724 **5 Claims**



1. Apparatus for converting a loader bucket into a pallet loader, said bucket having an elongated flat digging blade portion integral with an upwardly extending curved scoop portion, said apparatus including: at least one tine harness, said harness including:

A. an elongated tine, said tine being flat at least from a rearward portion to an intermediate portion thereof;

B. a flexible elongated fastening member attached to a rearward portion of said tine;

C. means for fixedly positioning an intermediate portion of said tine with respect to a leading edge of said bucket digging blade portion;

D. a fastening device, said device being adapted to move from an elongated open position to a shortened closed position;

E. means for attaching said device to a portion of said fastening member spaced from said rearward portion of said tine and means for attaching said fastening device to said intermediate portion of said tine when said tine is positioned under said flat digging blade portion of said bucket, said fastening member is extended over said scoop portion of said bucket, said intermediate portion of said tine is fixedly positioned with respect to the leading edge of said bucket, and said fastening device is open; and

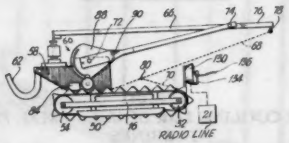
F. said fastening device being operable from said open to said closed position to firmly clamp said tine from said intermediate portion to said rearward portion to the underside of said flat digging blade portion.

4,242,036

REMOTELY OPERATED PLACEMENT EQUIPMENT

William F. Slaght, Ste-Foy, Canada, assignor to Her Majesty the Queen in right of Canada, Ontario, Canada

Filed Sep. 2, 1977, Ser. No. 833,293
Claims priority, application Canada, Sep. 15, 1976, 261234
Int. Cl.[3] B60P *3/28*
U.S. Cl. 414—737 22 Claims



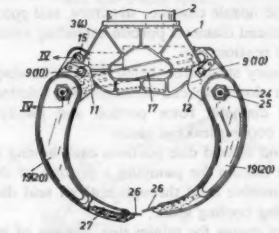
1. A remotely operated track vehicle comprising:
a lightweight frame having a deck portion and first and second track guiding portions;
a drive drum located at one end of each said track guiding portions;
first and second electric motors connected each to one of said drive drums;
first and second track means each encircling and operatively associated with one of said drive drums and one of said track guiding portions; and
an obstacle hook pivotally mounted on said deck portion, said obstacle hook being oriented forward of the vehicle and located above the ground so that the bottom portion of said obstacle hook will ride up onto the surface of an obstacle in a camming action, said pivot point being above the level of said track means and a camming surface extending downwardly at an acute angle from said pivot point toward said track means to permit the track means to engage the obstacle to move said vehicle over the obstacle as said vehicle is moved forward.

4,242,037

GRIPPING TOOL, PARTICULARLY FOR HANDLING TIMBER

Börje N. V. Baumgarten, Hassela, Sweden, assignor to Hiab-Foco AB, Sweden

Filed May 31, 1979, Ser. No. 44,194
Claims priority, application Sweden, Jun. 27, 1978, 7807249
Int. Cl.[3] B66C *3/16*
U.S. Cl. 414—739 4 Claims



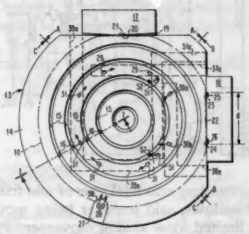
1. An improved gripping tool, particularly intended to be fitted on the jib of a crane, said gripping tool comprising gripping jaws which are arranged to pivot towards and away from one another relative to a gripping tool support member, the improvement comprising
two tubular shafts, connecting rods by means of which said gripping jaws are removably secured in pairs to said two tubular shafts,
coaxial shaft journals provided on said gripping tool support member, said gripping jaws arranged so as to pivot jointly in opposite directions about said coaxial shaft journals,
a laterally directed hub sleeve on each one of said gripping jaws, said hub sleeves having a non-round cross-sectional shape and arranged for insertion into a correspondingly shaped end of the associated tubular shaft.

4,242,038

WAFER ORIENTING APPARATUS

Hugo A. E. Santini, and David P. Wick, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,166
Int. Cl.[3] B65G *51/02, 47/24*
U.S. Cl. 414—755 14 Claims



1. Apparatus for orienting a substantially flat wafer or the like having a flat registration edge, said apparatus comprising:
means providing a flat surface for supporting the wafer and providing a series of directional fluid jet ports,
means extending upwardly from said flat surface and providing two registration surfaces,
sense means associated with each of said registration surfaces,
means for advancing the wafer toward contact with said registration surfaces, and
means controlled by the conditioning of said sense means for controlling selective supply of fluid to said jet ports, including means for rotating the wafer one way until a particular one of said sense means associated with a predetermined one of said registration surfaces is activated, then rotating the wafer the opposite way until sense means in both registration surfaces are concurrently activated for causing wafer motion to be terminated, thereby to prevent overshoot and insure precision registration of the wafer flat registration edge adjacent said predetermined registration surface without contamination and with minimal physical contact defined solely by contact with said sense means.

4,242,039

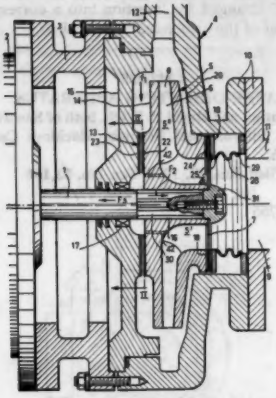
PUMP IMPELLER SEALS WITH SPIRAL GROOVES

Jean-Claude Villard, Echirolles, and Gilbert Berthereau, Eybens, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 15, 1978, Ser. No. 962,032
Claims priority, application France, Nov. 22, 1977, 77 35036
Int. Cl.[3] F04D *29/16*
U.S. Cl. 415—112 9 Claims

1. A pump comprising a housing having an axial inlet and a peripheral outlet, an axial drive shaft rotatable in the housing, a paddle wheel impeller on the drive shaft having a plurality of outwardly extending passageways for the receipt of liquid from said inlet and the discharge of liquid to said outlet upon rotation of the drive shaft and impeller, and a hydrodynamic seal on each axial side of the impeller, each seal comprising a pair of confronting discs disposed peripendicular to the axis of the pump, one disc of each pair being fixed against rotation

relative to the housing and the other disc of each pair being mounted for rotation on the impeller, one of said discs of each pair having spiral grooves thereon, and a bellows fixed to the



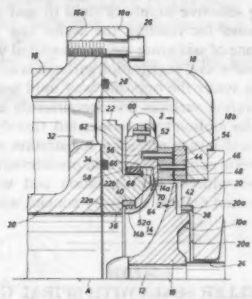
housing and surrounding said inlet, one of said fixed discs being carried by said bellows, said impeller being mounted on said drive shaft for limited axial sliding movement relative to the drive shaft.

4,242,040

THRUST ADJUSTING MEANS FOR NOZZLE CLAMP RING

Judson S. Swearingen, Los Angeles, Calif., assignor to Rotoflow Corporation, Los Angeles, Calif.

Filed Mar. 21, 1979, Ser. No. 22,417
Int. Cl.[3] F01O *11/00*
U.S. Cl. 415—113 **12 Claims**



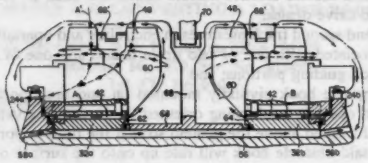
1. A rotary fluid handling apparatus comprising:
first and second coaxial bodies mounted for relative axial movement therebetween and having respective opposed radially facing annular surfaces;
seal means disposed between and sealing between said annular surfaces, and comprising a first annular sealing member;
said apparatus defining a first pressure zone communicating with one axial side of said seal means;
first stop means on said first body engageable with said first sealing member to permit the force exerted on said first sealing member by the pressure of said first zone to be transmitted to said first body;
second stop means on said second body engageable with said first sealing member to permit the force exerted on said first sealing member by the pressure of said first zone to be transmitted to said second body and to retain said first sealing member against force-transmitting engagement with said first stop means, said second stop means being releasable to permit force-transmitting engagement between said first sealing member and said first stop means.

4,242,041

ROTOR COOLING FOR DOUBLE AXIAL FLOW TURBINES

George J. Silvestri, Jr., Upper Chichester, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 806,404, Jun. 14, 1977, Pat. No. 4,150,917.
This application Jan. 15, 1979, Ser. No. 3,458
Int. Cl.[3] F01D *25/00, 11/00*
U.S. Cl. 415—115 **4 Claims**



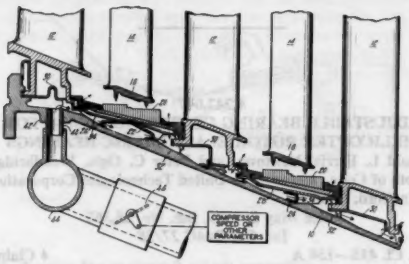
1. An elastic fluid turbine apparatus comprising:
a first and a second motive fluid expansion stage, said first and second stages respectively including first and second stationary structures, said first and second stationary structures respectively having first and second annular nozzle chamber structures, said stages being arranged in axially opposed parallel flow relation with each other;
a rotor structure having first and second disc portions respectively disposed adjacent said first and second stationary structures, said first and second disc portions each having an annular row of blades circumferentially disposed thereon and cooperatively associated with the respective first and second nozzle chamber structures, said disc portions each having an axially upstream side adjacent said associated nozzle chamber structure and an axially downstream side remotely disposed relative to said associated nozzle chamber structure, said rotor also having a reduced diameter portion extending axially between said disc portions;
said stationary structures, being annular in shape, are disposed in closely spaced encompassing relation with said reduced diameter rotor portion and jointly therewith define a cooling leakage space;
said first and second disc portions each having at least one aperture therein for pumping a portion of the once expanded motive fluid through both of said discs and the connecting cooling space;
first sealing means for minimizing leakage of motive fluid between said cooperating nozzle chamber structures and discs;
second sealing means for minimizing motive fluid leakage from said first sealing means into said cooling space; and
means for guiding said motive fluid leakage from said first sealing means to the downstream side of said first and second disc portions, said guiding means including a plurality of openings axially extending through said nozzle chamber structures from adjacent the upstream side of the disc portions to between said stationary structures.

4,242,042

TEMPERATURE CONTROL OF ENGINE CASE FOR CLEARANCE CONTROL

Frederick M. Schwarz, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 16, 1978, Ser. No. 906,394
Int. Cl.[3] F01D 11/08
U.S. Cl. 415—116 7 Claims



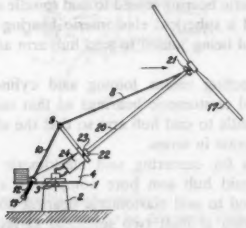
1. For a gas turbine engine having a plurality of axially spaced rotors and a case surrounding said axially spaced rotors, a corresponding number of outer air seals between said rotors and said case, means supporting said outer air seals concentrically spaced from said case and defining therewith a double wall construction having an annular passage surrounding said rotors which wall construction includes openings for allowing core air to leak into said annular passage and extending from an upstream to a downstream position relative to the engine's gas path, means external of said case supplying cool air at an upstream position into said annular passage for flowing into the downstream end to the gas path for regulating the leakage of air from said gas path into said annular passage, control means for regulating the flow of said cool air for controlling the temperature in said annular passage for effectuating contraction and expansion of said case, and means interconnecting said outer air seal and said case for positioning said outer air seal relative to the rotors with the contraction and expansion of said case.

4,242,043

WINDMILL

Peder U. Poulsen, Strandvejen 666, DK-2930 Klampenborg, Denmark

Filed Jul. 20, 1978, Ser. No. 926,566
Claims priority, application Denmark, Jul. 22, 1977, 3341/77
Int. Cl.[3] F03D 7/04
U.S. Cl. 416—11 7 Claims



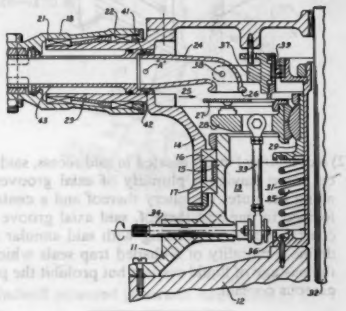
1. A windmill comprising:
an inclined shaft;
a set of propellers attached to an upper free end of said shaft,
a first bearing rotatably supporting a lower end portion of said shaft,
a pedestal supporting said first bearing,
a second bearing rotatably supporting an upper portion of said shaft, said second bearing having a non-rotating portion surrounding said shaft,
a staying device spaced from and positioned above said shaft, said staying device extending between said pedestal and said non-rotating portion of said second bearing and affecting the shaft with a moment which is oppositely directed and substantially corresponds to the bending moment created by the weight of the shaft and the propellers on the shaft at its other end, said shaft being inclined with respect to the wind direction so that the resultant of the wind impact on the propellers is substantially a tensile force in the direction of the shaft.

4,242,044

COMPENSATING STRUCTURE FOR CIRCULATION CONTROL ROTOR PNEUMATIC VALVE

George A. McCoubrey, Westfield, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 11, 1979, Ser. No. 56,590
Int. Cl.[3] B64C 27/18
U.S. Cl. 416—20 A 10 Claims



1. In a system for ventilated helicopter rotor blades, a rotor assembly for controlling the air flow into the blades comprising,
a stationarily mounted rotor mast,
a rotor hub rotatably mounted on said rotor mast, said rotor mast and hub forming a plenum for maintaining air fed thereinto,
a plurality of rotor blades attached to said rotor hub,
a plurality of air ducts carried one each by each said rotor blade, each duct having a downwardly extending nozzle section extending into said plenum,
means for regulating flow of air into each downwardly extending nozzle section, and
means for restricting movement of said downwardly extending nozzle section when said air duct is deflected by deflection of said rotor blades.

4,242,045

TRAP SEAL FOR OPEN CIRCUIT LIQUID COOLED TURBINES

Clayton M. Grondahl, Clifton Park, and Malcolm R. Germain, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,539
Int. Cl.[3] F01D 5/18
U.S. Cl. 416—92 13 Claims

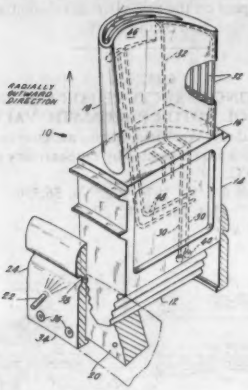
1. An improved cooling system for a gas turbine of the type including a turbine disc mounted on a shaft rotatably supported in a casing, a plurality of turbine buckets extending radially outward of said disc, each of said buckets including a root portion mounted in said disc, a shank portion extending radially outward from said root portion to a platform portion and

an airfoil extending radially outward from said platform portion, said cooling system comprising:

(a) a plurality of cooling channels formed in the airfoil of each of said buckets for distributing coolant through said airfoils;

(b) means for supplying liquid coolant to each of said cooling channels, said means including a plurality of trap seals, each of said trap seals comprising:

(1) an annular recess formed in said bucket; and



(2) a cylindrical insert located in said recess, said cylindrical insert having a plurality of axial grooves formed along the outer periphery thereof and a central recess formed in one end thereof, said axial groove and said central recess cooperating with said annular recess to define a plurality of S-shaped trap seals which permit the passage of liquid coolant but prohibit the passage of gaseous coolant.

4,242,046

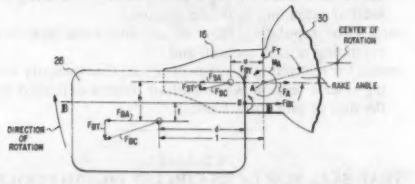
FAN SPIDER WITH RAKE ANGLE

Joseph V. Matucheski; Clifford S. L. Yee; Michael T. Spellman; Donald J. Hartley, all of Indianapolis, and William D. Barton, Plainfield, all of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,790

Int. Cl.³ F04D *29/38*

U.S. Cl. 416—132 A **6 Claims**



1. A spider construction for a sheet metal fan for use in combination with an internal combustion engine to cool an associated radiator, said spider construction comprising a central spider having a center of rotation and a plurality of like spider arms extending outwardly therefrom, each of said spider arms carrying a separately formed fan blade rigidly mounted thereon; each of said spider arms having a generally radial fan blade mounting line axis, a root section normal to said mounting line axis and disposed adjacent said central spider, and said mounting line axis being canted forward in the intended direction of rotation with respect to a radial line from said center of rotation through the center of said root section and intersecting said radial line at said root section center; and each fan blade having a center of mass angularly displaced in trailing relation to said radial line with the net bending moment at said root section about an axis passing through the center of said root section and parallel to an axis of rotation through said spider center of rotation being less than in like spider constructions wherein said spider arms extend substantially radially.

4,242,047

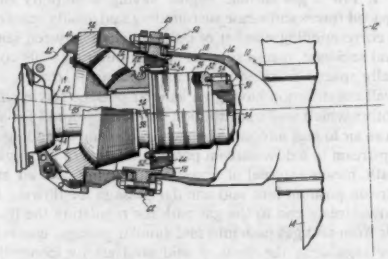
ADJUSTABLE BEARING CENTERING MEANS FOR HELICOPTER ROTOR ELASTOMERIC BEARINGS

Donald L. Ferris, Newtown, and Peter C. Ogle, Woodbridge, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1979, Ser. No. 35,365

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—134 A **4 Claims**



1. A helicopter rotor having a hub member rotatable about an axis of rotation and at least one hub arm extending radially therefrom for rotation therewith and said hub arm having a substantially radially extending cylindrical bore therewithin,

(A) a blade member extending substantially radially from said hub member and including a spindle at its radial inner end extending into said hub arm bore,

(B) elastomeric bearing means connecting said spindle to said hub arm so as to support said blade from said hub arm and so that blade centrifugal force generated during rotor rotation will impart compressive loading on said elastomeric bearing means,

(C) said elastomeric bearing means including a cylindrical elastomeric bearing joined to said spindle at its radial inner end and a spherical elastomeric bearing having a static apex and being joined to said hub arm at its radial outer end,

(D) connecting means joining said cylindrical and said spherical elastomeric bearings so that said bearings join said spindle to said hub arm so that the elastomeric bearings operate in series,

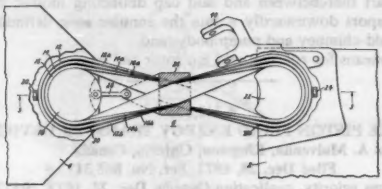
(E) means for centering said elastomeric bearing means within said hub arm bore comprising a centering ring connected to said elastomeric bearing connecting means and having at least two spherical surfaces at the outer periphery thereof coincident with said spherical elastomeric bearing static apex, centering socket means positioned within and connected to said hub arm bore and including at least two spherical bearing portions coincident with said spherical elastomeric bearing static apex and adapt to matingly engage the centering ring spherical surface so as to center said spherical elastomeric bearing about its static apex when said rotor is in static mode.

4,242,048

SEMI-ARTICULATED FLEXSTRAP

Francis H. McArdle, Norristown, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1977, Ser. No. 838,391
Int. Cl.³ B64C *27/38*
U.S. Cl. 416—134 A **20 Claims**



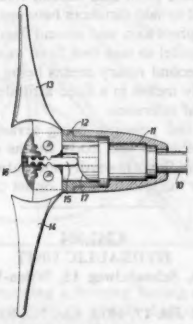
1. A rotor for an aircraft which comprises:
a blade;
a hub;
a first strap adapted to be connected to said hub and to said blade; and
a second strap adapted to be connected to said hub and to said blade, said second member overlapping said first member at a crossover point located between said blade and said hub so as to permit relative movement between said first and second members; and wherein said first and second straps at said crossover point are each twisted approximately ninety degrees with respect to an end thereof.

4,242,049

FOLDABLE PROPELLER

Hans Forsling, Örebro, and Anders Lindecrantz, Svarta, both of Sweden, assignors to Hasselfors Stainless AB, Svarta, Sweden

Filed Feb. 6, 1979, Ser. No. 10,142
Claims priority, application Sweden, Feb. 6, 1978, 7801345
Int. Cl.³ B63H *1/24*
U.S. Cl. 416—142 **1 Claim**



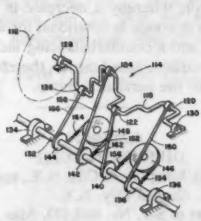
1. A foldable propeller, comprising:
(a) a propeller shaft adapted to be drivingly rotated about its axis in one direction for forward propulsion, and in the opposite direction for reverse propulsion;
(b) a cam element co-rotatably secured to said shaft, and having a cam surface extending between abutments;
(c) a carrier element carried on said cam element, said elements being rotatable with respect to each other by a limited amount;
(d) a pair of propeller blades pivoted on said carrier element for movement between (1) a working position in which they project radially outwardly therefrom, and (2) a rest position in which they are directed rearwardly in line with said shaft, said blades being movable to said working position during rotating of said shaft in said one direction in response to centrifugal force and their pitch;
(e) a plunger means slidable axially in said carrier element and having a rack portion meshing with gear sectors on said propeller blades, and a cam follower portion for engaging said cam surface; and
(f) said cam surface extending in a circumferential direction and having a degree of inclination varying in the axial direction from a relatively steep slope, where said cam follower portion is disengaged during shaft rotation in said one direction, to a zero or negative slope where said cam follower portion is engaged at the end of its travel during shaft rotation in said opposite direction.

4,242,050

WINDMILL POWER GENERATOR

Richard M. Oakes, Box C, Bernice, Okla. 74331

Filed Feb. 14, 1980, Ser. No. 121,428
Int. Cl.³ F03D *11/02*
U.S. Cl. 416—170 R **12 Claims**



1. A windmill powered generator comprising:
a frame;
a rotary wind operated member;
a crankshaft operably connected to the wind operated member for rotation therewith, a crank arm connected to the crankshaft, the outer end thereof being offset from the rotational axis of the crankshaft;
an elongated rotary power drive shaft spaced from the crankshaft, a frictional hub member connected to the drive shaft for rotation therewith; and
an elongated flexible line having a first end operably connected to the outer end of the crank arm, said flexible line being passed around one side of the frictional hub member and including means for yieldably securing the second end of the flexible line;
whereby travel of the crank arm end away from the drive shaft increases the frictional force between the flexible line and the drive shaft to cause rotation of the drive shaft and whereby travel of the crank arm toward the drive shaft decreases the frictional force between the flexible line and the drive shaft allowing the drive shaft and associated frictional hub to slip with respect to the flexible line.

4,242,051

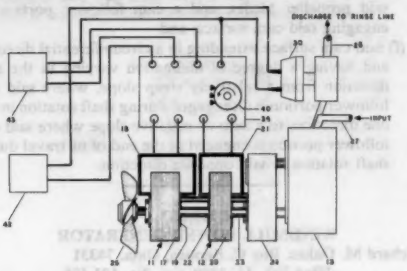
FEED CONTROL SYSTEM FOR PUMPING FLUIDS TO DISHWASHERS AND THE LIKE

William L. Mason, Garden Grove, and William K. Russell, Costa Mesa, both of Calif., assignors to Knight Equipment Corp., Costa Mesa, Calif.

Filed Feb. 22, 1979, Ser. No. 14,041
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—38 **20 Claims**

1. A feed control system for pumping a fluid having a non-linear shear rate, comprising:

(a) a peristaltic pump;
(b) a constant torque, A.C. powered shaded pole motor for driving the pump;
(c) a variable speed, D.C. powered shaded pole motor connected to the A.C. motor, and acting as an electromagnetic brake on the A.C. motor; and,



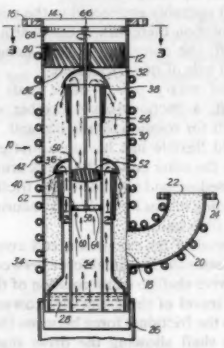
(d) an A.C. to D.C. rectifier for supplying D.C. power to the variable speed motor; the peristaltic pump being driven by the A.C. motor, whereby a decrease in viscosity of the fluid casues a decrease in rotational force to the constant torque motor and a counterbalancing increase in braking power of the variable speed motor, thereby linearizing the flow of fluid to the peristaltic pump.

4,242,052

DIFFUSION PUMP

Tadeusz J. Marchaj, Long Island City, N.Y., assignor to Preload Technology, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 890,222, Mar. 27, 1978, which is a continuation of Ser. No. 622,501, Oct. 15, 1975, abandoned. This application May 18, 1978, Ser. No. 907,358
Int. Cl.³ F04F *9/00*
U.S. Cl. 417—154 **9 Claims**



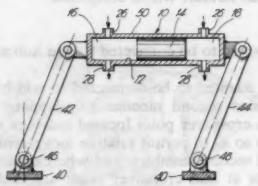
1. A vacuum diffusion pump adapted to prevent backstreaming of motive vapor molecules into the space to be evacuated, comprising:
(a) a cylindrical pump body having an inlet port in an upper part thereof and an outlet port in a lower part thereof;
(b) boiler means housed within the bottom of said pump body for vaporizing a motive fluid;
(c) at least one, substantially cylindrical vapor chimney positioned within said pump body, communicating at its lower end with said boiler and discharging vaporized motive fluid from the boiler into said pump body, said pump body and chimney defining an annular zone therebetween;
(d) cooling means associated with said cylindrical pump body for condensing said motive fluid vapors;
(e) a fan rotor rotatably positioned adjacent said inlet port, said fan rotor including vanes positioned to impel motive fluid and evacuated vapors downwardly into said cylindrical pump body;
(f) a cap for said chimney fixedly connected to the lower part of said fan rotor and rotatably positioned above said chimney, said cap and chimney top defining an effluent part therebetween and said cap deflecting motive fluid vapors downwardly within the annular zone defined by said chimney and pump body; and
(g) means for rotating said fan rotor and cap.

4,242,053

FREE PISTON FLUID ENERGY TRANSFER DEVICE

Charles A. Mulvenna, Kingston, Ontario, Canada

Filed Dec. 28, 1977, Ser. No. 865,317
Claims priority, application Canada, Dec. 22, 1977, 293772
Int. Cl.³ F04B *19/02*
U.S. Cl. 417—211 **52 Claims**



1. A fluid energy transfer device, comprising:
at least one body means having at least one expansible fluid chamber and fluid inlet and outlet passages for delivering fluid to and from said chamber;
first rotary means rotatably mounted to said body means at a first pivot axis for rotating said body means about a first fixed axis, the first pivot axis being located at a distance remote from said first fixed axis;
second rotary means rotatably mounting said body means at a second pivot axis for rotating said body means about a second fixed axis, the second pivot axis being located at a distance remote from said second fixed axis, which distance is equal to said distances between the first fixed axis and the first pivot axis, said second fixed axis being spaced from and parallel to said first fixed axis, and
said first and second rotary means being effective to maintain said body means in a fixed attitude with respect to a fixed frame of reference
said chamber and passages being arranged in said body means such that as said body means rotates about said fixed axes fluid flows inwardly and outwardly to and from said chamber via said inlet and outlet passages.

4,242,054

HYDRAULIC UNIT

Kurt Christiansen, Schnabelweg 15, Wilen-Wollerau, Switzerland

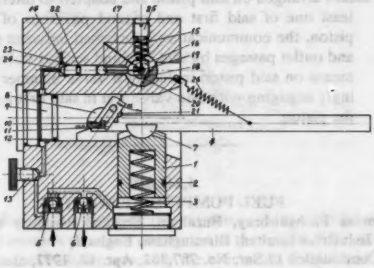
Filed Jul. 17, 1978, Ser. No. 925,522
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—218 **11 Claims**

1. A hydraulic control device for maintaining the product of the operation pressure and the displacement of a displacement pump constant, comprising
servo piston means for controlling the displacement of the pump, and
a pilot system for controlling movement of said servo piston means, said pilot system comprising
sensing piston means for sensing the operating pressure of the pump, said sensing piston means being movable

along a sensing piston axis in response to the operating pressure,

pilot piston means operatively coupled to said sensing piston means and hydraulically coupled to said servo piston means for controlling the application of fluid pressure to said servo piston means,

force exerting means for supplying force along a force axis, said force axis being nonlinear with said sensing piston axis, and



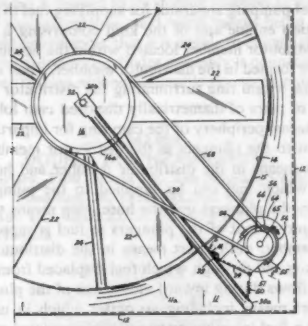
a movable bearing acted on by forces generated by said sensing piston means and said force exerting means at the intersection of said sensing piston axis and said force axis, said bearing being coupled mechanically to said servo piston means by a coupling lever to move said bearing as a function of the position of said servo piston means.

4,242,055

ATTIC FANS AND APPARATUS FOR SUPPORTING THE DRIVE MOTORS OF ATTIC FANS

John V. Felter, Austin, Tex.

Filed Aug. 17, 1978, Ser. No. 934,510
Int. Cl.³ F04B *35/04*
U.S. Cl. 417—362 **5 Claims**



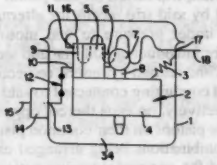
1. Attic fan, comprising a housing having a plate having a circular opening therethrough, a blade shaft concentric of said opening supporting plural circularly spaced radially disposed air impeller blades for rotation within said opening, pulley means associated with said blade shaft which when rotated rotates said blades, an electric drive motor supported by a motor support shaft disposed transverse to said plate and having sheave means carried on its drive shaft, drive belt means engaged about said sheave means and said pulley means whereby said pulley means is rotated when said motor is operated, means biasing said motor in a direction away from said blade shaft to maintain said drive belt means in tightened condition about said sheave means and said pulley means, said blade shaft being supported beneath said blades by a plurality of circularly spaced lower radial arms depending between said housing and said blade shaft, said blade shaft being supported above said blades by an upper radial arm depending between said housing and said blade shaft, said drive belt means being a V-belt, said sheave means having belt groove means thereabout with which said V-belt is engaged, said pulley means including a cylindrical outer surface against which said V-belt is drivingly engaged, said air impeller blades being affixed at their inner ends between spaced upper and lower circular plates rotatably supported at their centers by said blade shaft, said cylindrical outer surface of said pulley means comprising an upstanding cylindrical flange depending from the outer periphery of said upper circular plate and being unitary therewith, said motor support shaft being fixed to said housing at its lower end and being fixed to said upper radial arm at its upper end.

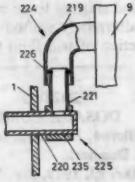
4,242,056

ENCAPSULATED REFRIGERATOR

Jan Dyhr, Sonderborg, and Ole J. Nissen, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 849,308, Nov. 7, 1977, Pat. No. 4,160,625.
This application Mar. 22, 1979, Ser. No. 22,985
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650937
Int. Cl.³ F04B *17/00, 35/00;* F16L *39/04*
U.S. Cl. 417—363 **6 Claims**



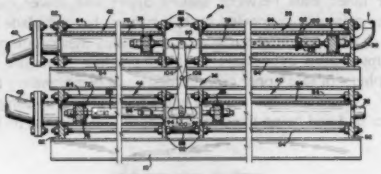


1. An encapsulated refrigerator assembly, comprising, a capsule, an integrated motor and compressor unit resiliently mounted in said capsule with said motor unit having a generally vertically extending axis, a compressor inlet port, an inlet port in said capsule in circumferential alignment with said compressor port but axially and radially offset therefrom relative to said motor axis, pipe fittings for said ports having their free ends in axially offset relation to each other, a connecting pipe between said fittings, upper and lower articulated joint means between said pipe and said fittings, one of said articulated joint means having engaging journal and bearing sections with each said journal section having a hole which provides fluid communication between the interiors of said journal and bearing sections, the other of said articulated joint means forming a telescopic joint to allow telescopic action to compensate for axial variations in the spacings of said fittings and to allow relative axial vibrational movement between said compression unit and said capsule.

4,242,057
TANDEM LONG STROKE RECIPROCATING MUD PUMP ASSEMBLY

Emil A. Bender, 6625 Kane Way, Bakersfield, Calif. 93309

Continuation-in-part of Ser. No. 12,729, Feb. 16, 1979, abandoned. This application Sep. 24, 1979, Ser. No. 78,185
Int. Cl.³ F04B 17/00
U.S. Cl. 417—404 13 Claims

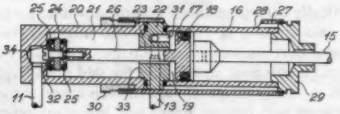


1. A tandem reciprocating piston pump assembly having at least a pair of motor-pump combinations, each of said motors comprising a first cylinder, a first source of fluid under pressure, a first piston reciprocable in said cylinder, and means for introducing said first fluid to one side only of said first piston; each of said pair of driven pumps comprising a second cylinder, a second piston reciprocable in said second cylinder, a second source of fluid under pressure, and means for introducing said second fluid to one side only of said second piston; said assembly further comprising a pair of piston rods, arranged common to and interconnecting the pistons of each motor-pump combination, trip means on said piston rods, and control means actuated by said trip means for alternately introducing said first fluid under pressure to said motors, said first and second means for introducing said first and second fluids to one side of said first and second cylinders, respectively, comprising first and second conduiting connected to said motor and pump cylinders, respectively, on ends thereof opposite the mounting of the respective pistons on their common piston rods, said two motor-pump combinations being arranged essentially parallel one another and for opposed pumping action in that one motor-pump assembly is in a pumping mode while the other is in a charging mode, with said second fluid entering the second cylinder thereof, said trip means comprising a pair of collars, one to each piston, and shifting lever means connected to said control means and alternately shifted by said collars to thus reverse said introduction of said fluid to said motors.

4,242,058
DOSAGE PUMP

Miloslav Zakora, Hillerod, Denmark, assignor to A/S N. Foss Electric, Hillerød, Denmark

Filed Mar. 23, 1979, Ser. No. 23,289
Claims priority, application Denmark, Mar. 28, 1978, 1363/78
Int. Cl.³ F04B 23/00
U.S. Cl. 414—437 4 Claims

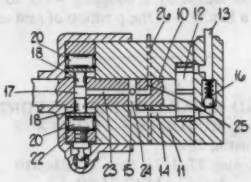


1. A dosage pump comprising:
a housing including a cylinder,
said housing containing a valve chamber communicating with said cylinder and having spaced first and second valve seats defining valve openings;
a piston sealingly engaging with the inner surface of the cylinder and movable between a first position in which the piston defines a first volume in said housing, and a second position in which the piston defines a second greater volume in the housing;
a valve member connected to said piston and arranged within said valve chamber so as to engage with said first and second valve seats in the first and second positions of the piston, respectively;
inlet and outlet passages communicating through said valve chamber and valve openings with said first and second volumes in the housing;
means arranged on said piston and adapted to interrupt in at least one of said first and second positions of the said piston, the communication established between said inlet and outlet passages by said first and second volumes, said means on said piston including a valve member for sealingly engaging with said valve seat in said first position of the piston.

4,242,059
FUEL PUMPING APPARATUS

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 787,352, Apr. 14, 1977, abandoned.
This application Jan. 24, 1979, Ser. No. 6,168
Claims priority, application United Kingdom, Apr. 20, 1976, 15898/76
Int. Cl.³ F04B 19/22; F09B 29/00
U.S. Cl. 417—462 1 Claim



1. A fuel pumping apparatus for supplying fuel to a compression ignition engine and of the kind comprising a housing, a rotary distributor member located within the housing, a transverse bore formed in the distributor member, a pair of plungers in the bore, a cam ring surrounding the distributor member, a plurality of pairs of diametrically disposed cam lobes formed on the internal periphery of the cam ring for imparting inward movement to the plungers as the distributor member rotates, inlet port means in the distributor member and housing and through which fuel can be supplied to the pump chamber defined by the plungers and the bore, stop means to limit the outward movement of the plungers as fuel is supplied to the pump chamber, outlet port means in the distributor member and housing and through which fuel displaced from the pump chamber flows during inward movement of the plungers, said outlet port means including an outlet which in use, is connected to a fuel injection nozzle of the associated engine, and a further pair of diametrically opposed bores formed in the distributor member and communicating with said pumping chamber, said further bores and said bore being disposed in the same radial plane, a further pair of plungers housed in the further bores respectively, said further pair of plungers and said bores being of smaller diameter than the first mentioned pair of plungers and said bore, said further pair of plungers being positioned so that during rotation of the distributor member they will be moved inwardly by a pair of said cam lobes slightly before the first mentioned pair of plungers, the inward movement of the further pair of plungers and said first mentioned pair of plungers taking place during the time when fuel can flow through said outlet port means.

4,242,060

FOOT PUMPS

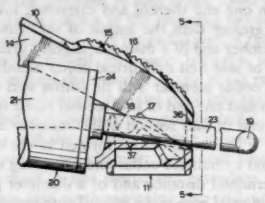
Ernest J. Price, Solihull, England, assignor to E. J. Price (Developments) Limited, Birmingham, United Kingdom

Filed May 12, 1978, Ser. No. 905,559

Claims priority, application United Kingdom, May 13, 1977, 20096/77

Int. Cl.³ F04B *19/02*

U.S. Cl. 417—464 **5 Claims**



1. In a foot pump of the kind comprising a base member, an operating member pivotally connected to the base member and while in use can be depressed by the user's foot from a raised position, a piston-and-cylinder assembly connected between the operating member and the base member and operative to compress or expel air when the operating member is depressed, and return spring means incorporated in the piston-and-cylinder assembly and operative in normal use to be loaded by depression of the operating member from its raised position and to urge the operating member towards its raised position, the invention comprising a first connection pivotally connecting said cylinder to the operating member and a second releasable connection pivotally connecting said piston rod to the base member, the arrangement being such that when said second connection is released from the base member the operating member can be depressed from its raised position to enable the pump to assume a storage position without causing the loading of the return spring means that occurs in normal use, catch means carried by one of said members and being so disposed as to detachably engage the piston rod automatically when the pump is moved to its storage position to retain said rod in said storage position, said catch means being also disposed on said one member that it is unable to engage the piston rod when the piston-and-cylinder assembly is connected to the base member by said second releasable connecting means.

4,242,061

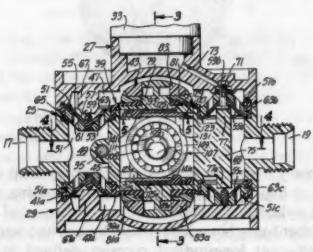
DOUBLE DIAPHRAGM PUMP

E. Dale Hartley, 2700 Jalmia Dr., Los Angeles, Calif. 90046

Filed Sep. 28, 1978, Ser. No. 946,770

Int. Cl.³ F04B *23/06, 39/00*; F16H *21/14*

U.S. Cl. 417—536 **19 Claims**



1. An apparatus comprising:

a reciprocable member having first and second spaced apart drive surfaces;

means for mounting said reciprocable member for reciprocating movement along a path;

a rotatable drive member for driving said reciprocable member in both directions along said path;

means for mounting said drive member for rotation about a rotational axis;

said drive member having a peripheral surface between said first and second drive surfaces, said peripheral surface extending circumferentially of said rotational axis;

first and second wear members between said peripheral surface and said first and second drive surfaces, respectively, each of said wear members being engageable with said peripheral surface;

first means for mounting the first wear member on said reciprocable member for at least limited movement toward and away from the rotational axis;

second means for mounting the second wear member on the reciprocable member for at least limited movement toward and away from the rotational axis;

first support means between said first drive surface and said first wear member to at least partially support the first wear member; and

second support means between said second drive surface and said second wear member to at least partially support the second wear member whereby rotation of said drive member causes the peripheral surface to bear against the first wear member to drive the reciprocable member in a first direction along the path and to bear against the second wear member to drive the reciprocable member in a second direction along the path.

4,242,062

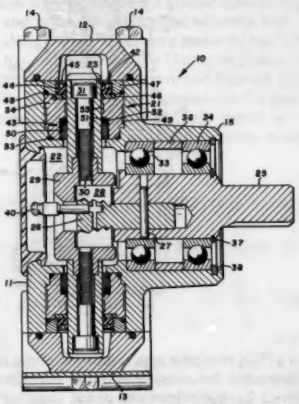
DUAL PISTON PUMP WITH PRESSURE SEAL LUBRICATION FEATURE

Ramon Pareja, Edina, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 6, 1979, Ser. No. 64,129

Int. Cl.³ F04B *1/02, 21/00*

U.S. Cl. 417—536 **2 Claims**



1. A piston-type pump comprising:

(a) a housing defining a closed loop and having an endless passageway formed therein, said closed loop surrounding an inner crankcase, an inlet communicating with said endless passageway, an outlet spaced from said inlet and also communicating with said endless passageway, a pair of open-end cylinders lying mutually in spaced relation between said inlet and said outlet, each communicating with said endless passageway and with said inner crankcase, said cylinders being substantially diametrically opposed, cylindrical sleeve means having an inner end and

an outer end and disposed in each of said cylinders and a plunger reciprocably positioned in each of said sleeves;

(b) a drive shaft journaled for rotation within said housing, an eccentric crank portion along said drive shaft, self-aligning drive bearing means on said crank portion, connecting rods coupling said eccentric crank portion to each of said plungers;

(c) each said cylindrical sleeve means having a pressure seal assembly adjacent said outer end thereof and a vacuum seal assembly adjacent said inner end thereof and an annular groove formed along the periphery of said cylindrical sleeve generally mid-way between said seal assemblies and a bore formed through the wall of said cylindrical sleeve coupling said annular groove to the inlet chamber of said pump body;

(d) each said pressure seal assembly comprising a generally "U"-shaped cup held bewteen inner and outer annular retaining discs wherein the inner peripheral edge surface of said inner retaining disc is disposed in running contact with said plunger surface, and wherein said inner annular disc consists of polytetrafluoroethylene;

(e) each said vacuum seal assembly comprising an inner guide sleeve adjacent the inner end of said cylindrical sleeve means, and an adjacent vacuum sleeve of polytetrafluoroethylene disposed outwardly of said inner guide sleeve and resilient means biasing said vacuum sleeve against the outer surface of said plunger.

4,242,063

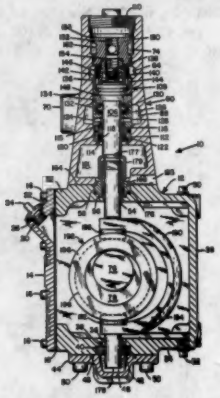
HIGH PRESSURE MULTI-CYLINDER PUMP

Ramon Pareja, Minneapolis, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Division of Ser. No. 856,341, Dec. 1, 1977, Pat. No. 4,184,817. This application Jun. 13, 1979, Ser. No. 48,021

Int. Cl.³ F04B *21/02, 39/10*

U.S. Cl. 417—571 **4 Claims**



1. In a fluid pumping apparatus of the type including a camshaft journaled for rotation in an oil containing crankcase, a head block having at least one piston chamber formed therein affixed to said crankcase, a piston member disposed in said piston chamber, means coupling said camshaft to said piston for imparting reciprocating motion thereto, and a unitary inlet/outlet valve disposed in said piston chamber between a low pressure fluid inlet port and a high pressure fluid outlet port, the improvement comprising:

(a) first sealing means disposed in said head block adjacent to said unitary inlet/outlet valve and concentrically surrounding a first portion of said piston during its entire travel, said first sealing means including;

(1) a first cylindrical collar member abutting said unitary inlet/outlet valve having an axial bore therethrough of a diameter greater than the diameter of said first portion of said pistons; a counterbore of a diameter greater than said axial bore formed in one end thereof extending inwardly a predetermined distance and a cylindrical flange integrally formed at the other end thereof having a diameter greater than that of said counterbore to thereby form a shoulder;

(2) a second cylindrical collar member having an axial bore therethrough of a diameter to provide a sliding fit with respect to said first portion of said piston, a counterbore formed in one end thereof and extending inwardly for a distance greater than the length of said first cylindrical collar member and of a diameter slightly greater than the diameter of said first cylindrical collar member such that said first collar member will fit within said counterbore formed in said one end of said second collar member with said one end of said second collar member abutting said shoulder, a first counterbore formed in the other end of said second cylindrical collar and extending inwardly for a predetermined distance and of a diameter greater than that of said axial bore and a second counterbore formed in said other end of said second cylindrical collar and extending inwardly for a distance less than said predetermined distance of said first counterbore formed in said other end of said second cylindrical collar;

(3) a first flexible cylindrical, U-cup seal member disposed in said counterbore of said first cylindrical collar;

(4) a first U-cup seal support ring disposed in said first counterbore formed in said one end of said second cylindrical collar and abutting said first U-cup seal member;

(5) a second flexible, cylindrical U-cup seal member disposed in said first counterbore formed in said other end of said second cylindrical collar; and

(6) a second U-cup seal support ring disposed in said second counterbore formed in said other end of said second cylindrical collar member and abutting said second U-cup seal member.

4,242,064

ROTARY FLUID PUMP WITH ECCENTRICALLY MOVING PUMPING SLEEVE

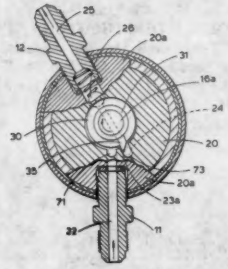
Philip B. Uncles, Bradford-on-Avon, England, assignor to Moulton Developments Limited, Bradford-on-Avon, England

Filed Jan. 26, 1979, Ser. No. 6,771

Claims priority, application United Kingdom, Jan. 26, 1978, 03203/78

Int. Cl.³ F04C *2/00*

U.S. Cl. 418—66 **7 Claims**



1. A rotary hydraulic pump for delivering small volumes of liquid at a high pressure comprising: a housing defining a generally cylindrical pump chamber between axial end walls, said chamber being bounded radially by a cylindrical wall, two closely adjacent longitudinal recesses defined in said wall constituting inlet and outlet ducts of the chamber, a shaft passing axially through said end walls, offset means on the part of the shaft which is located within the chamber defining a crank, said outlet duct having planar parallel walls and an

arcuate base tangentially joined to said planar walls, said inlet duct having an arcuate wall, said outlet duct arcuate base being essentially equal in size to said inlet duct so that said outlet duct is larger than said inlet duct, a cylindrical pumping sleeve surrounding the crank, means slidably connecting said sleeve to said crank so that said sleeve rotates with said crank but can slide therearound, said crank being mounted off the longitudinal centerline of said chamber so that said sleeve moves eccentrically within the chamber as said crank rotates so that the external cylindrical surface of the pumping sleeve cooperates with the cylindrical surface of the radial wall of the chamber to define a crescent-shaped clearance between said surfaces which rotates around the chamber as said crank rotates so that liquid introduced through the inlet duct into said chamber is impelled around said chamber towards the outlet duct, a tooth for preventing said sleeve from rotating as said sleeve moves eccentrically within said chamber, said tooth being connected at one end thereof to said sleeve and extending radially outward therefrom, said tooth extending into said outlet duct and having a planar wall making line contact with one of said outlet duct planar walls to inhibit rotation of said sleeve, said tooth bring sized to essentially completely close said outlet duct when said crank rotates said tooth into said outlet duct, said tooth having a planar top which is slanted toward said crank and away from said inlet duct to force fluid out of said outlet duct.

4,242,065

SLIDING VANE COMPRESSOR WITH END FACE INSERTS OR ROTOR

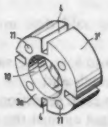
Yutaka Ishizuka, Higashimatsuyama, and Shinichi Kobayashi, Kawagoe, both of Japan, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 961,147

Claims priority, application Japan, Nov. 19, 1977, 52/155917[U]

Int. Cl.³ F04C *29/00, 29/02*

U.S. Cl. 418—91 **10 Claims**



1. In a sliding vane compressor of the type having a housing and a rotor journalled for rotation in a chamber of the housing so that the axial endfaces of the rotor are juxtaposed with slight clearance relative to the cooperating housing surfaces, a combination comprising means bounding a plurality of recess in each axial end face of the rotor; and an insert received in each of said recesses and being of a material having a relatively low coefficient of friction and having a coefficient of thermal expansion which is higher than that of the material of the rotor so that, upon reaching a predetermined temperature, said inserts expand and extend across the respective clearance into contact with said housing surfaces to prevent direct contact between the same and said axial endfaces of the rotor, said inserts having outer faces exposed at said axial end faces and being flush with the same at temperatures below said predetermined temperature.

4,242,066

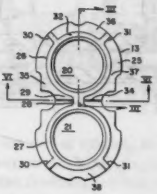
ROTARY PUMPS AND MOTORS AND THRUST PLATES THEREFOR

Robert F. Hodgson, Youngstown, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Aug. 24, 1978, Ser. No. 936,205

Int. Cl.³ F04C *2/18*

U.S. Cl. 418—132 **22 Claims**



9. A pressure plate for corresponding ends of a pair of cooperating gears in a rotary gear pump or motor comprising a metal body in the general form of a pair of joined rings arranged as a figure 8, having a front face adapted to abut the gear ends and a rear face spaced from and generally parallel to the front face, a pair of openings through the rings to receive gear shafts, a pair of at least half annular grooves in the rear face spaced from and surrounding each of said openings at least on one side, a groove in the rear face connecting said annular grooves at their closest points, at lease one groove in the rear face extending radially from each at least half annular groove to the periphery of the body generally opposite the groove connecting the annular grooves defining at least two substantially identical areas on opposite sides of the body, a generally U-shaped elastomer gasket having the contour of the combined grooves on the rear face of the body and fitting into said grooves with the opening of the U-shaped gasket opening downwardly in the groove and, resilient means acting on said gasket normally to urge it partially out of said grooves into sealing contact with the case and fluid delivery means extending across said plate transversly to said groove connecting said annular grooves and intersecting the same whereby high pressure fluid passes along said fluid delivery means to said groove intermediate the top and bottom of the U-shaped gasket, down between the U-shaped gasket and groove and through beneath said gasket into the interior thereof the pressurize the gasket to the maximum pressure of the pump and said gasket acts as a check valve between the groove and fluid delivery means.

4,242,067

HYDRAULIC SCREW MACHINE WITH BALANCE PLUNGER

Lars H. Segerström, Skärholmen, Sweden, assignor to Imo-Industri Aktiebolag, Stockholm, Sweden

Filed Sep. 12, 1978, Ser. No. 941,645

Claims priority, application Sweden, Sep. 15, 1977, 7710357

Int. Cl.³ F03C *2/08;* F04C *2/16, 15/00*

U.S. Cl. 418—203 **4 Claims**

1. A hydraulic screw machine comprising:

a housing having a fluid inlet adjacent one end thereof and a fluid outlet adjacent the opposite end thereof;

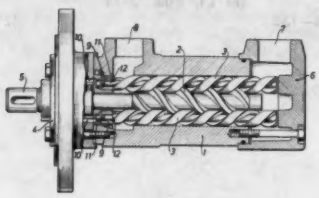
a driving screw disposed within said housing between said inlet end and said outlet end and journalled for rotation at one end of said housing;

at least one impeller screw intermeshing with said driving screw within said housing and journalled for rotation at the same end of said housing as said driving screw is journalled; and

a balance plunger on the journalled end of said impeller screw for balancing the axial pressure forces acting on said impeller screw, the diameter of said balance plunger being greater than the root diameter of said impeller screw,

the thread of said impeller screw extending with full depth

all the way to said balance plunger, and the length of said plunger being less than the axial width of the thread groove in said driving screw so that said plunger can pass



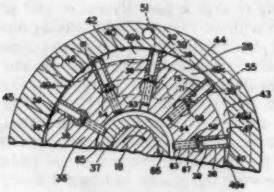
through said thread groove when said impeller screw is inserted into said housing from the end opposite the end at which said screws are journalled during assembly of the machine.

4,242,068

VANE PUMP WITH BYPASS FOR LEAKAGE OF FLUID WHEN BOTTOM OF VANE IS CONNECTED TO UNDERVANE SUCTION PORT

Edwin L. Shaw, Delaware, Ohio, assignor to Abex Corporation, New York, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,631
Int. Cl.³ F04C *2/356*
U.S. Cl. 418—269 **2 Claims**



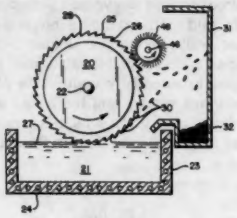
1. In a vane pump having: a rotor member; a stator member; a cam surface on one of the members; a plurality of vane slots formed in the other member; a vane in each slot for movement relative thereto and having a leading face, a trailing face, an inner end, an outer end, a first sealing lip on said outer end adjacent the leading face, a second sealing lip on said outer end adjacent the trailing face; a first bore connecting said inner end and said outer end, said bore having a fluid restrictor therein which causes a pressure drop when fluid flows through the restrictor as the vane moves inwardly of the slot; said rotor and stator members cooperating with a pair of port plates to provide a suction ramp, a transfer zone, a pressure ramp and sealing zone; said vanes sequentially traversing said suction ramp, transfer zone, pressure ramp and sealing zone; a main suction port and a pressure port in said port plates; an undervane suction port communicating with the main suction port for admitting fluid to the vane slots below the inner ends of the vanes therein; said undervane suction port extending beyond said suction ramp in the direction of rotor rotation to an angular position at which a vane whose slot is in communication with said undervane suction port is part way across said transfer zone; the improvement comprising a fluid passage in said vane which connects said first bore with the trailing face upstream of said restrictor to provide an unrestricted path for high pressure fluid from the pressure port which leaks across the first sealing lip when said vane leading face is exposed to high pressure fluid as it traverses said pressure ramp during the time the inner end of said vane is connected to said undervane port and thus prevents the leakage fluid from flowing through the restrictor in the first bore and creating a pressure differential across said restrictor and between said inner and outer ends of said vane.

4,242,069

APPARATUS FOR PRODUCING FLAKE

Robert E. Maringer, Worthington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 826,798, Aug. 22, 1977, Pat. No. 4,154,284. This application Jan. 24, 1979, Ser. No. 6,017
Int. Cl.³ B01J *2/02*
U.S. Cl. 425—8 **6 Claims**



1. An apparatus for the production of flake particles from the surface of molten material which is at a temperature within 25% of its equilibrium melting point in degrees K, said molten material having a viscosity of 0.001 to 1 poise and a surface tension of 10 to 2,500 degrees per centimeter at said temperature, which apparatus comprises:

(a) means for supporting said molten material surface;

(b) a heat extracting disk member having an angularly tapered edge with a plurality of serrations on said tapered edge:

(c) means for rotating said disk member about its axis of rotation;

(d) means for raising and lowering said disk member relative to said molten material; and

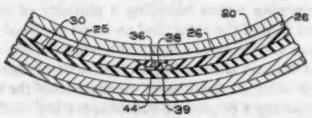
(e) a first edge face on each serration leading in said rotation and angled for contact against the surface of said material, a second edge face on each serration trailing in said rotation and extended between the first edge face of one serration and the first edge face of an adjacent serration, angle for avoiding contact against the surface of said material.

4,242,070

SHAPE OF CUT FOR SEMICURE BUTYL RUBBER BAG

Richard F. Garver, and Srbo M. Stevanovich, both of Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 28, 1980, Ser. No. 125,422
Int. Cl.³ B29C *1/00*; B29D *29/00*
U.S. Cl. 425—28 B **6 Claims**



1. A cylindrical expandable vulcanized sleeve for use as a bladder in a curing process having a pair of annular end portions and a circumferentially extending cylindrical expandable body between said end portions, said expandable body having an outer surface and an inner surface with a medium circumfer-

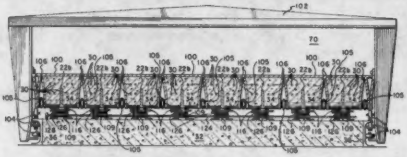
entially extending centerline therebetween, a longitudinally extending splice extending lengthwise from one end portion to the other end portion of said cylindrical body, said splice having a pair of spaced inclined surfaces interconnected by a recessed shoulder.

4,242,071

CONCRETE RAILROAD TIE CASTING AND HANDLING SYSTEM

Frederick M. Stinton, Woodbridge, Canada, assignor to Martin Concrete Engineering Company, Fort Worth, Tex.

Division of Ser. No. 928,697, Jul. 27, 1978. This application Aug. 14, 1978, Ser. No. 933,283
Int. Cl.³ B28B *23/06*
U.S. Cl. 425—111 6 Claims



1. A system for slip-forming concrete cross ties, comprising:

an elongated casting bed,

a plurality of casting frames arranged side by side and end to end on the casting bed each casting frame supporting a casting plate above the casting bed,

a continuous casting machine movable along the bed while the casting plates remain stationary, the machine having means for forming a casting chamber above each casting plate, each casting plate having upper surfaces of a variable height above the casting bed in the direction of movement of the casting machine, the upper surface conforming to the shape of a top surface of a cross tie formed in inverted orientation thereon, each casting plate having outer edges each of which is disposed in a generally vertical plane along the entire length of the casting plate, said means making a fluid seal at points of sliding engagement with each casting plate as the machine moves along the bed,

said means comprising a horizontal pressure plate attached to the casting machine rearward of a source of fluidized concrete, and downwardly extending legs affixed to the pressure plate, each leg having an upper sloping portion and a lower generally vertical portion, the lower vertical portions slidably and sealably engaging corresponding outer edges of the variable height surfaces of the casting plates.

3. A machine for slip-forming concrete products of irregular geometry, the concrete products being formed on casting plates arranged side by side and end to end on a generally horizontal casting bed, each vertical edge lying in a vertical plane along the entire length of its respective casting plate, the machine comprising:

a generally horizontal pressure plate held at a predetermined height above the casting bed,

a plurality of legs extending downward from the pressure plate to form a casting chamber above each casting plate, the legs having lower generally vertical portions of sufficient dimension to slidably and sealably engage the generally vertical edges as they rise and fall in relation to the machine as it moves down the length of the bed, and

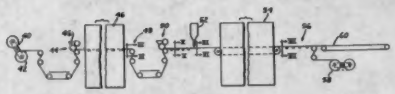
means for resiliently urging the legs against the respective vertical edges of the casting plates.

4,242,072

APPARATUS FOR MANUFACTURING PAD MEMBERS

James H. Enicks, Box 247, Meadowbrook La., Blawenburg, N.J. 08504

Division of Ser. No. 813,447, Jul. 7, 1977, Pat. No. 4,173,814. This application Jun. 28, 1979, Ser. No. 53,289
Int. Cl.³ B29D *27/04*
U.S. Cl. 425—130 15 Claims



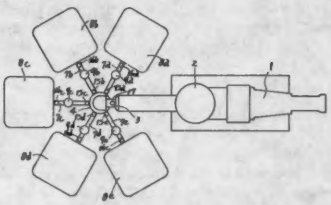
1. An apparatus for use in making an elastomeric material having at least a portion of the thickness thereof foamed and another portion of the thickness unfoamed and comprising: an elongated support web adapted for continuous longitudinal movement, a first station operable for depositing a layer of heat fusable elastomeric material free of blowing agent on said support web, a second station for heating said first layer, a third station operable for depositing a second layer of the same elastomeric material in flowable form but containing a blowing agent on said first layer, a fourth station operable for depositing a ribbon of fusable plastic material on said second layer in at least one selected lateral region thereof, a fifth station for heating the superposed layers and the said ribbon to fuse and bond said layers and ribbon, and means downstream from said fifth station for separating the fused material from said support web.

4,242,073

INJECTION MOLDING APPARATUS AND MOLDING METHOD WITH USE OF THE APPARATUS

Shiro Tsuchiya; Itsuo Imakita, and Toshiaki Okumura, all of Kawaramachi, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed May 4, 1978, Ser. No. 902,847
Claims priority, application Japan, May 13, 1977, 52/55659
Int. Cl.³ B29F *1/06*
U.S. Cl. 425—149 9 Claims



1. An injection molding apparatus comprising a resin plasticizing machine having an outlet nozzle, a branch portion connected to the outlet nozzle and having a plurality of outlet ports adapted to communicate with the outlet nozzle, a plurality of molds arranged around the branch portion, an extension nozzle for maintaining each of the outlet ports in communication with each of the molds, means for closing the extension nozzle, and means for injecting the plasticizing resin to the mold, characterized in that (a) there is a resin plasticizing injection machine having an injection nozzle connected to the branch portion, (b) the injection nozzle is provided with a main shutoff valve at its forward end, (c) the extension nozzle is provided with a second shutoff valve at its foward end, (d) pressure control means is provided on the extension nozzle at a position between the closing means and the second shutoff valve, and (e) said closing means is located between said main shutoff valve and said pressure control means.

4,242,074

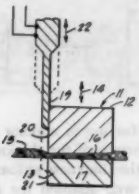
APPARATUS FOR HEAT-TRIMMING FOAM MATERIAL

Connie Lake, Tinley Park, Ill., assignor to Creative Industries, Inc., Bridgeview, Ill.

Continuation of Ser. No. 595,530, Jul. 14, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,953

Int. Cl.³ B29C *17/00, 17/14*

U.S. Cl. 425—292 **7 Claims**



1. An apparatus for heat-trimming thermoplastic foam materials by melting the portion of the thermoplastic foam to be trimmed comprising,

two opposed non-heated, heat conducting metallic die parts made from a metal of high heat-conductivity and forming a trim guide for the foam material, and limiting the trimming action by absorbing the heat of melting of the foam material along the aligned edges of said die parts, as trimmed, and means carrying said absorbed heat away from said die parts,

pressure means moving at least one die part relative to the other to open said die parts and receive the foam material to be trimmed therebetween, and operable to exert sufficient pressure on the foam material to compress the foam material along the edge to be trimmed,

a source of heat at a temperature at least high enough to melt or vaporize at least a portion of the exposed foam material, and trim the exposed material along the die parts by melting at least a portion of the material up to the edges of the die parts,

means applying the source of heat along the exposed edge of the foam material to melt or vaporize the edge of the foam material along the two die parts, said die parts having sufficient heat-conductivity to stop melting of the exposed material by absorbing the heat of melting of the foam material as pressurizing the foam material and provide a clean edge of the trimmed material without flash.

4,242,075

EXTRUSION DIES FOR EXTRUDING HONEYCOMB STRUCTURAL BODIES

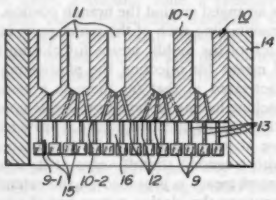
Noboru Higuchi, Nagoya, and Shoji Futamura, Kawasaki, both of Japan, assignors to NGK Insulators, Ltd. and Institute of Technology Precision Electrical Discharge Works, both of, Japan

Filed Apr. 26, 1978, Ser. No. 900,168

Claims priority, application Japan, May 4, 1977, 52/51791

Int. Cl.³ A01J *21/00*

U.S. Cl. 425—462 **3 Claims**



1. In extrusion dies for extruding honeycomb structural bodies which comprise a plurality of cell blocks having a cross sectional shape conforming to cells of the honeycomb structural body, a spoke supporter, and spokes, one end of each of said spokes being fixed to a respective cell block and the other end thereof being integrally secured to the spoke supporter, said cell blocks forming discharge slits conforming to the cross sectional shape of the honeycomb structural body, the improvement comprising, said spoke supporter is provided with a plurality of feed inlets extending from one end surface of the spoke supporter toward the spokes, each inlet having a terminus within said spoke supporter, a plurality of channels having a smaller diameter than said inlets extending from each said terminus to the end surface of the spoke supporter to which the spokes are secured.

4,242,076

PROCESS OF COMBUSTION

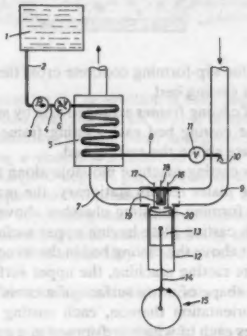
Ernst Rawyler-Ehrat, Kometsträsschen 40, Schaffhausen, Switzerland

Filed Dec. 28, 1978, Ser. No. 973,842

Claims priority, application Switzerland, Jan. 3, 1978, 45784/78

Int. Cl.³ F23J *7/00*

U.S. Cl. 431—4 **8 Claims**



1. An improved combustion process comprising the steps of:

(a) introducing a catalyst for promoting dissociation of water vapor into H_2 and O_2 into a combustion chamber;

(b) adding water vapor to a fresh air and hydrocarbon mixture;

(c) directing the fresh air and hydrocarbon mixture having water vapor added thereto into the combustion chamber having the catalyst for promoting dissociation of water vapor into H_2 and O_2 so that the catalyst will convert water vapor into H_2 and O_2; and

(d) burning the fresh air and hydrocarbon mixture in the enriched atmosphere of H_2 and O_2.

4,242,077

FLUID BED FURNACE AND FUEL SUPPLY SYSTEM FOR USE THEREIN

Charles E. Hyre, Chesterton, Ind., assignor to Fennell Corporation, Harvey, Ill.

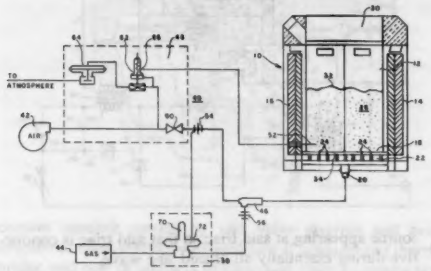
Filed Nov. 6, 1978, Ser. No. 958,138

Int. Cl.³ F23D *19/02;* **F23Q** *3/00*

U.S. Cl. 431—19 **12 Claims**

1. A fuel supply system for use in a fluid bed furnace or the like of the type including a fluid bed containing a quantity of inert, particulate material which fluidizes in response to sufficient gas flow therethrough and a burner for burning a supplied fuel and providing the fluid bed with a gas mixture flow at an elevated temperature for heating and fluidizing the fluid

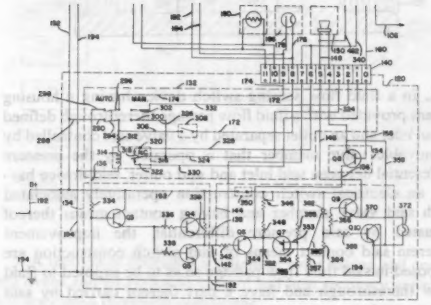
bed, said fuel supply system comprising: a source of air; a source of gas fuel; mixing means coupled to the furnace burner for mixing the air and gas fuel together for providing the burner with a fuel mixture; flow rate control means for providing said air and gas fuel to said mixing means in desired proportions; and fluid bed level detecting means for sensing the level of the inert fluidizable material within the fluid bed and coupled to said flow rate control means for varying the flow rates of the gas fuel and air provided to said mixing means in relation to the level of the fluidizable material within the fluid bed.



4,242,078
CENTRALIZED AUTOMATIC PILOT/PILOTLESS IGNITION CONTROL SYSTEM

Hollis E. Nelson, 138 Kilmer Ave., Campbell, Calif. 95008, and Donald G. Seely, 416 Tryon St., Burlington, N.C. 27215

Continuation-in-part of Ser. No. 693,375, Jun. 7, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,785
Int. Cl.[3] F23Q *9/08, 7/12;* H02J *7/00*
U.S. Cl. 431—45 23 Claims



1. A centralized automatic pilot/pilotless ignition control system for controlling a combustible fuel burning appliance from a location remote from said appliance, said appliance being equipped with a main fuel supply valve connected to a source of fuel, a main burner connected through said main fuel supply valve to said source of fuel, a pilot burner for said main burner, said pilot burner being connected through a pilot valve to said source of fuel, and an electrically energized fuel igniter operatively associated with said pilot burner, said control system comprising:

temperature sensing means for regulating the operation of said appliance, said temperature sensing means being operative to call for an ignition and maintenance of a flame at said main burner;

first circuit means remote from said appliance and responsive to said temperature sensing means to activate said pilot valve to permit a flow of fuel to said pilot burner;

second circuit means remote from said appliance and responsive to said temperature sensing means to start an automatic ignition cycle for producing a flame at said pilot burner, said second circuit means including means to activate said electrically energized fuel igniter;

alarm timing means remote from said appliance and responsive to the start of said ignition cycle to produce an alarm if no pilot flame occurs within a predetermined time;

pilot generator means responsive to a pilot flame to reset said alarm timing means;

third circuit means remote from said appliance and responsive to said pilot generator to open said main fuel supply burner upon occurrence of a pilot flame, whereby a main burner flame is produced;

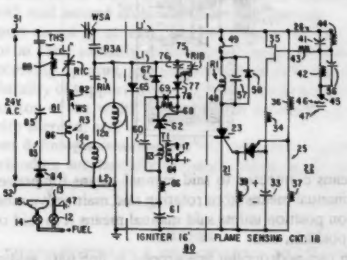
manual control circuit means operable when said first and second circuit means are disabled to permit manual operation of said pilot valve and said electrically energized igniter; and

switch means for enabling said manual control circuit means and disabling said first and second circuit means.

4,242,079
FUEL IGNITION CONTROL SYSTEM

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Division of Ser. No. 790,408, Apr. 25, 1977, Pat. No. 4,178,149.
This application Dec. 7, 1978, Ser. No. 967,261
Int. Cl.[3] F23Q *9/14*
U.S. Cl. 431—46 12 Claims



1. In a fuel ignition control system including valve means operable to supply fuel to a burner for ignition to establish a flame, a control arrangement comprising activate means including first switching means operable when enabled to prepare an energizing path for said valve means, and circuit means including energy storage means for causing current to flow over a circuit path including said first switching means and first normally closed contacts, for enabling said first switching means, and flame sensing means including second switching means operable to open said first contacts and to close second contacts to complete said energizing path to energize said valve means, said activate means further including resistance means connected in parallel with said first contacts to provide a holding path for said first switching means when said second switching means operates to open said first contacts.

4,242,080
SAFETY DEVICE FOR GAS BURNERS

Tohru Tabei, Zama, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 11, 1978, Ser. No. 932,827
Int. Cl.[3] F23Q *9/08*
U.S. Cl. 431—54 5 Claims

1. A safety device adapted for use with a gas combustion apparatus having a pilot which is proven by a thermocouple, comprising,

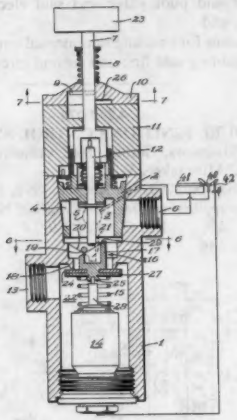
a valve body having an inlet opening adapted to be connected to a source of gas under pressure, outlet opening adapted to be connected to a main burner of the combus-

tion apparatus, and a second outlet opening adapted to be connected to a pilot,

safety valve means connected between said inlet opening and said outlet openings to shut off gas flow when in an inoperative position and held in an operative position by an electromagnetic device energized by a pilot heated thermocouple,

main valve means connected in series with said safety valve means,

manual means movable in an axial and rotative direction connected to said main valve means axially from said inoperative position to said operative position and for rotating said main valve means from an off to on position,



first means connected to said manual means for preventing said manual means from rotating said main valve means to said on position unless said manual means is in said operative position, and

first pin means dropping in a groove in line with said safety valve means in said body when said safety valve means is in said operative position for preventing axial movement of said manual means to said operative position and thus said manual means is not in a position for rotative movement of said main valve means from said off position to said on position.

4,242,081

OIL BURNER PRIMARY CONTROL FOR INTERRUPTED IGNITION SYSTEM

Donald E. Donnelly, Edwardsville, Ill., and William B. Feero, St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 5, 1979, Ser. No. 17,584
Int. Cl.³ F23N *5/08*
U.S. Cl. 431—71 **12 Claims**

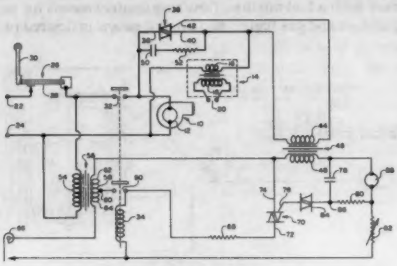
1. In a control system for enabling energizing of an electrically operable device under a first condition and deenergizing thereof under a second condition,

first circuit means including a triac for controlling energizing of said device by an alternating current power source;

second circuit means responsive to said first condition for generating a plurality of pulses at a frequency substantially greater than that of said alternating current power source and responsive to said second condition for preventing generating of said pulses; and

a coupling transformer having a primary winding in said second circuit means and a secondary winding in said first circuit means responsive to said pulses for controlling conduction of said triac,

at least one of said pulses occurring early in each half of the sine wave of an alternating current from said power



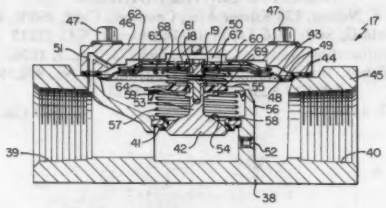
source appearing at said triac so that said triac is conductive during essentially all of said sine wave.

4,242,082

FLUID FLOW SENSING SWITCH DEVICE

Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 23, 1978, Ser. No. 936,112
Int. Cl.³ H01H *35/34, 35/40;* F23N *5/06*
U.S. Cl. 431—72 **26 Claims**



1. In a fluid flow sensing switch device having a housing means provided with a fluid flow passage therethrough defined by an inlet and an outlet separated by a valve seat controlled by a movable valve member that is operated by the pressure differential between said inlet and said outlet, said device having an electrical switch construction operatively associated with said valve member and having contact means thereof actuated by said pressure differential, the improvement wherein said contact means of said switch construction are disposed in said fluid flow passage so as to be exposed to fluid flow therethrough and have a part thereof carried by said valve member.

4,242,083

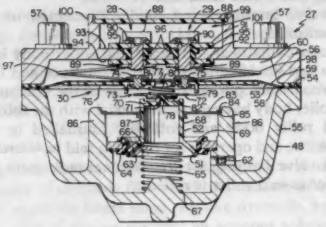
FLUID FLOW SENSING SWITCH DEVICE

Roy C. Demi, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 23, 1978, Ser. No. 936,113
Int. Cl.³ H01H *35/34, 35/40;* F23N *5/06*
U.S. Cl. 431—72 **39 Claims**

1. In a fluid flow sensing switch device having a housing means provided with a fluid flow passage therethrough defined by an inlet and an outlet separated by a valve seat controlled by a movable valve member that is operated by the pressure differential between said inlet and said outlet acting on a flexible diaphragm carried by said housing means, said device having an electrical switch construction operatively associated with said valve member and having contact means thereof disposed in said fluid flow passage so as to be exposed to fluid flow therethrough and being actuated by said pressure differ-

ential acting on said flexible diaphragm, the improvement wherein said contact means comprises a pair of spaced apart contacts carried by said flexible diaphragm and a bridging



contact member carried by said valve member and being adapted to make contact with said pair of contacts and thereby bridge said pair of contacts to close said switch construction.

4,242,084

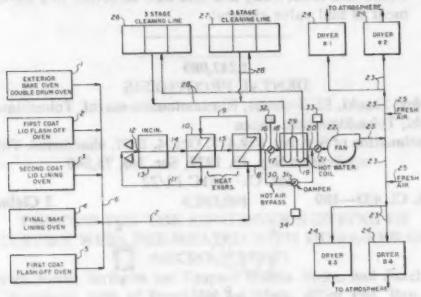
AIR POLLUTION CONTROL AND HEAT RECOVERY SYSTEM FOR INDUSTRIAL OVENS

Aziz A. Jamaluddin, 1912 Nursery Rd., Woodlands, Tex. 77380

Filed Jun. 15, 1979, Ser. No. 48,980

Int. Cl.³ F27D *17/00*; F26B *19/00*

U.S. Cl. 432—1 **9 Claims**



7. A method of operating a system of paint baking and coating ovens and air pollution control and heat recovery apparatus associated therewith comprising

collecting effluent gases containing combustible constituents at a concentration of about 25% LEL from a plurality of processing ovens,

preheating said collected gases to a predetermined elevated temperature,

burning said combustible constituents of said preheated gases in a fume incinerator having a plurality of flames,

conducting the combustion effluent from said incinerator in heat exchange with said collected gasses to preheat the same,

conducting said combustion effluent in heat exchange with circulating water to produce high pressure, high temperature water and circulating said heated water to storage,

circulating said combustion effluent from said water heat exchange by means of a high temperature insulated fan to a forced circulation hot air dryer, and

mixing said combustion effluent with fresh air prior to circulating the same into said dryer.

4,242,085

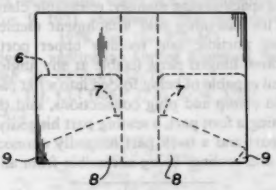
MULTI-PURPOSE ORTHODONTIC BRACKET

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Nov. 13, 1978, Ser. No. 959,671

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—14 **64 Claims**



1. A multi-purpose orthodontic bracket comprising:

a rear portion adapted to be mounted to a surface of a tooth, a front portion, and an intermediate portion interconnecting said front and rear portions;

means forming first and second arch wire receiving openings in at least a surface of at least one of said front and rear portions, said first arch wire receiving opening being larger than the second arch wire receiving opening;

means defining an arch wire contact surface over a minor portion of the width of the bracket and in communication with said second arch wire receiving opening;

support means on at least one of said front and rear portions for at least partially defining said larger first arch wire receiving opening, said support means including at least a plurality of support areas distributed along at least a major portion of the width of the bracket for receiving an arch wire thereon; and

means defining a retaining pin receiving slot in said bracket extending substantially perpendicularly to the arch wire receiving openings.

4,242,086

TRANSPORTABLE TREATMENT RECLINER

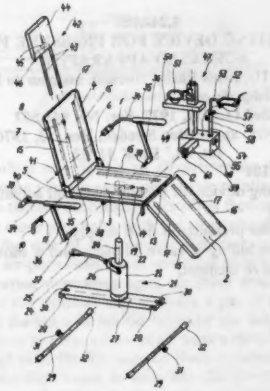
Siegfried Jörg, Geishügel 9, 8631 Ahorn, Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,602

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1977, 2747321

Int. Cl.³ A61G *15/00*

U.S. Cl. 433—33 **20 Claims**



1. A transportable treatment recliner continuously adjustable in height and from a seating to a lying position, and rotary

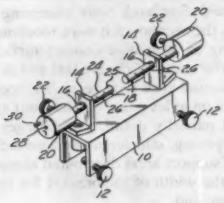
about a vertical axis, for medical, particularly dental or surgical care, comprising a recliner upper portion; a plurality of recliner attachment elements including arms and head rest and medical treatment equipment which are connected to the recliner by manually releasable clamp and plug connections which may be completely disassembled from said recliner manually and without tools, and accommodated in a transport container in a space-saving manner; releasable clamp and plug connections for fastening said attachment elements to said recliner upper portion; said recliner upper portion further comprising three hinged parts fixable at any angle relative to each other and capable of being folded into a flat package upon release of said clamp and plug connections, said three hinged parts comprising a foot part, a seating part hingedly connected to said foot part and a back part hingedly connected to said seating part; said recliner being accessible from all sides.

4,242,087

ARTICULATOR YOKE ASSEMBLY

Robert L. Lee, 22937 Grand Ter., Colton, Calif. 92324

Filed Nov. 30, 1978, Ser. No. 964,979
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—54 **14 Claims**



10. A mounting device for a dental articulator, comprising:
- a yoke-like bracket adapted to be removeably mounted on the rear vertical portion of a lower frame of said articulator to assist in mounting dental casts to the articulator;
- a pair of uprights attached to said bracket with axially aligned holes therein;
- a pair of hinge axis extension pins inserted into said holes in said uprights;
- a pair of adapters mounted for slidable, lateral adjustment on said extension pins, each of said adapters having means on its outer end for cooperating with tips of a dental facebow.

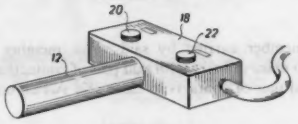
4,242,088

REGULATING DEVICE FOR PRESSURE FLUID ACTUATED APPARATUS

Björn Ekman, Upplands Väsby, Sweden, assignor to Dental AB, Upplands Väsby, Sweden

Filed Oct. 19, 1977, Ser. No. 843,557
Claims priority, application Sweden, Dec. 13, 1976, 7613985
Int. Cl.³ F16K *31/62*
U.S. Cl. 433—101 **5 Claims**

1. A regulating device for pressurized fluid actuated apparatus comprising
- a valve for the pressurized fluid supply,
- said valve including a valve housing and a movable flow control valve element,
- a foot controlled operating device connected to move said movable valve element of the valve,
- said operating device comprising an axially elongated roller body and a base structure,
- said valve housing being rigidly connected to said base structure,
- the outer cylindrical surface of said roller body being suitable and intended for resting on the floor and for rolling thereon when pushed by the foot of the operator,
- said roller body having a shaft coaxial with the rolling axis of said roller body and rotatably journalled in said base structure and operable for carrying said base structure and said valve housing for translational movement with said roller as said roller is rolled,



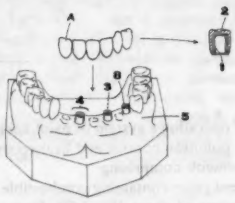
- said base structure having a dimension transverse to said rolling axis that exceeds the greatest transverse dimension of the roller body so as to limit rotational movement of said base structure about a horizontal axis when said roller body is rolled on the floor to thereby provide for relative rotational movement between said roller body and said base structure,
- and said shaft comprising a transmission means connected between said roller body and said valve element and arranged for transferring relative rotational movement between said roller body and said base structure to a movement of said valve element.

4,242,089

DENTAL PROSTHESIS

Hideki Sasaki, 53, 3-chome, Kuramotomoto-machi, Tokushima-shi, Tokushima-ken, Japan

Continuation of Ser. No. 839,477, Oct. 4, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 75,540
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—189 **2 Claims**



1. An artificial tooth arrangement comprising in combination:
- (a) a denture plate (6) having a magnet (3) embedded therein,
- (b) a root cap (7) which is adapted to be imbedded in a tooth root (B), and
- (c) a palladium-cobalt alloy attached to the upper surface of the root cap (7).

4,242,090

PROCESS FOR THE CONTINUOUS DYEING OF TEXTILE WEBS OF CELLULOSE FIBERS WITH REACTIVE DYES

Hans-Ulrich von der Eltz, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, am Main Fed. Rep. of Germany

Filed Mar. 27, 1979, Ser. No. 24,206

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1978, 2813400

Int. Cl.[3] D06P *3/82, 3/60*

U.S. Cl. 8—532 4 Claims

1. In a process for the continuous dyeing of a web of textile material made of cellulose fibers and of a mixture of cellulose fibers with synthetic fibers using reactive dyestuffs, by applying to the web of fibrous material an aqueous solution of at least one reactive dyestuff to which has been added, as fixation agents, a mixture of a liquid alkali water glass having a density of from 37° to 60° Bé and an alkali hydroxide solution having a density of from 30° to 45° Bé, introducing the treated material into a dwelling chamber where it is subjected in a cuttled-up or opened-out condition to a high humidity heating, removing it continuously from the dwelling chamber and then terminating dyestuff fixation by a brief steaming or by a brief immersion into a hot sodium sili ate solution, the improvement of which comprises: heating the textile material in the dwelling chamber after application of the liquor containing the reactive dyestuff and the mixture of fixation agents, and leaving it to stand there at a temperature of from 81° to 95° C. for a period of from 5 to 180 seconds.

4,242,091

PROCESS FOR THE CONTINUOUS DYEING OF TEXTILE WEBS PRE-HEATED WITH INFRA-RED OR MICRO-WAVES

Erich Feess, Hofheim am Taunus; Walter Birke, and Joachim Steinbach, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 862,664, Dec. 21, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,869

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658863; Mar. 25, 1977, 2713166

Int. Cl.[3] D06P *5/20, 3/60, 3/14*

U.S. Cl. 8—444 7 Claims

1. In a process for a continuous dyeing with a reactive or an acid dyestuff, wool or mixtures containing such fibers, as a textile web, or with a reactive or a sulfur dyestuff in reduced form, cellulose or mixtures containing such fibers, as a textile web, said textile web first having been impregnated with an aqueous liquor or printed with an aqueous printing paste containing said dyestuff, the improvement comprising preheating the textile web to temperatures from 97° to 104° C. by means of infrared waves or microwaves while maintaining a residual moisture content corresponding to at least the water retention content (at normal humidity) of said fibers during said preheating, and subsequently, while said fibers are at about said residual moisture content, in order to fix said dyestuff, treating said textile web with steam for 10 to 300 seconds without applying additional pressure.

4,242,092

METHOD OF SUBLIMATIC PRINTING ON SHEET STRUCTURES

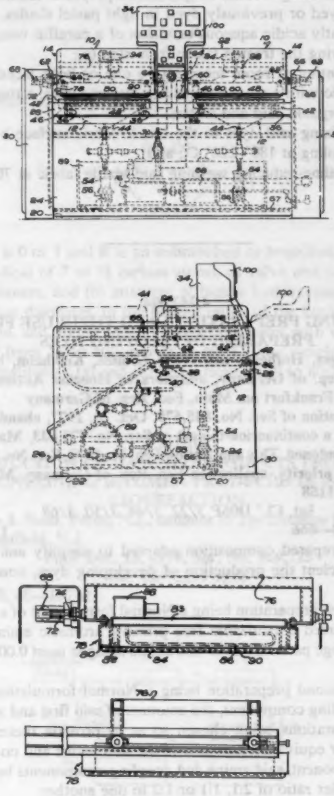
Richard D. Glover, Gedham Mills, Ossett, Yorkshire, England

Continuation of Ser. No. 708,979, Jul. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 633,338, Nov. 19, 1975, abandoned, which is a continuation of Ser. No. 422,046, Dec. 5, 1973, abandoned, which is a continuation of Ser. No. 197,057, Nov. 9, 1971, abandoned. This application Dec. 20, 1978, Ser. No. 971,441

Claims priority, application United Kingdom, Nov. 12, 1970, 53851/70; Dec. 24, 1970, 61314/70

Int. Cl.[3] D06P *1/16, 3/54, 5/20*

U.S. Cl. 8—472 10 Claims



1. A method of printing an air-permeable sheet structure which includes placing an air-permeable printing foil carrying on one side thereof sublimatic dyestuff in face-to-face relationship and in close proximity with the air-permeable sheet structure with the side of the printing foil carrying the dyestuff facing the air-permeable sheet structure, heating the printing foil for a period depending upon the sheet structure thickness to vaporize the dyestuff and applying a gas or vapor pressure differential during said period between the sides of the sheet structure so as to creat a flow of air from a space above the foil, and through both the foil and the sheet structure, and so as to cause the dyestuff vapor to flow into the sheet structure, said sheet structure being composed of a material to which the dyestuff has an affinity so that the dyestuff deposits on the sheet structure in the same pattern in which it appeared on the foil.

4,242,093

DOUBLE-FACE DYEING AND PRINTING OF POLYESTER FABRICS WITH DISPERSE DYES

Pietro Gasperini, Seveso, and Francesco Brunetti, Chieri, both of Italy, assignors to Aziende Colori Nazionali Affini Acna S.p.A., Milan, Italy

Filed Jun. 7, 1979, Ser. No. 46,430

Claims priority, application Italy, Jun. 8, 1978, 24321 A/78

Int. Cl.³ D06P *3/00, 3/80, 5/00*

U.S. Cl. 8—456 **2 Claims**

1. A process for the dyeing and printing of polyester textile fabrics to achieve differently shaded color effects on one or both faces of the fabric, comprising:

(a) contacting at room temperature a polyester textile fabric, undyed or previously dyed in light pastel shades, with a slightly acidic aqueous emulsion of a paraffin wax;

(b) drying the treated fabric from step (a);

(c) printing at room temperature one or both faces of the fabric with a paste comprising disperse dyes, a thickener, an organic acid and water;

(d) affixing said dyes to the textile fabric surface by thermosoling at 180°-220° C.; and

(e) alkaline-reducing washing said textile fabric at 70°-150° C.

4,242,094

DYEING PREPARATIONS AND THEIR USE FOR PREPARING DEVELOPING DYES

Erich Feess, Hofheim, and Willy Gronen, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 845,675, Oct. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 777,633, Mar. 15, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,222

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611188

Int. Cl.³ D06P *3/22, 3/44, 3/50, 3/68*

U.S. Cl. 8—666 **1 Claim**

1. A prepared composition adapted to simplify and make more efficient the production of developing dyes, consisting of:

(1) a first preparation being a Normal formulation of a finely dispersed diazotizable free primary aromatic amine, the average particle size of said amine being at most 0.002 mm, and

(2) a second preparation being a Normal formulation of a coupling component, the amounts of said first and second preparations being chosen so as to provide therein the molar equivalent amounts of the said amine and coupling component, said amine and coupling components being in a molar ratio of 2:1, 1:1 or 1:2 to one another.

4,242,095

YARN LUBRICANTS

Bobby C. Carver, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1979, Ser. No. 100,582

Int. Cl.³ D06M *00/00*

U.S. Cl. 8—115.6 **10 Claims**

1. Fiber lubricant composition comprising butyl stearate, ethoxylated-propoxylated alcohol having a SUS viscosity of 1,000 to 20,000 at 100° F. and prepared from a blend of ethylene oxide and propylene oxide reacted with an alcohol having 1 to 16 carbon atoms and effective amounts of emulsifying agents and antistatic agents.

4,242,096

IMMUNOASSAY FOR ANTIGENS

Robert J. Oliveira, Maplewood, and Spencer F. Silver, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 14, 1977, Ser. No. 851,491

Int. Cl.² G01N *33/16*

U.S. Cl. 23—230 B **15 Claims**

1. A method for the immunochemical determination of at least one antigen in a liquid sample comprising:

contacting said liquid sample simultaneously with (a) a predetermined quantity of an antibody specific for said antigen being determined; and (b) a composite comprising a piezoelectric oscillator having immobilized thereon in biologically active configuration said antigen or mixture containing said antigen, said composite having a premeasured frequency;

allowing the immunochemical reaction to proceed;

removing the oscillator from said liquid sample; and

measuring the change in frequency of said piezoelectric oscillator.

10. An immunological diagnostic kit for use in a competitive binding assay for the immunochemical determination of at least one antigen in a liquid sample comprising:

a composite comprising a piezoelectric oscillator having immobilized thereon in biologically active configuration an antigen or mixture containing the antigen being determined, said composite having a premeasured frequency; and

a predetermined quantity of antibody specific for said antigen being determined.

4,242,097

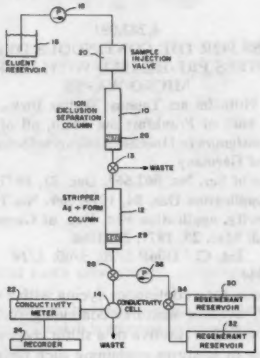
METHOD AND APPARATUS FOR QUANTITATIVE ANALYSIS OF WEAKLY IONIZED ANIONS OR CATIONS

William E. Rich, Jr., Mountain View; Edward L. Johnson, Milpitas, and Thomas O. Sidebottom, Palo Alto, all of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.

Filed Mar. 5, 1979, Ser. No. 17,576

Int. Cl.³ G01N *31/04, 31/08*

U.S. Cl. 23—230 R **25 Claims**



1. The method of chromatographic separation and quantitative analysis of a plurality of different weak anions of weakly dissociated acids or of salts of weakly dissociated acids, said method comprising

(a) directing a sample comprising a plurality of different weak anions of weakly dissociated acids or of salts of weakly dissociated acids, in an eluent solution through a chromatographic resin bed, said eluent comprising a strong acid substantially more dissociated than the acids of the weak anions, said strong acid being present at a con-

centration to substantially suppress ionization of said weak anions, said chromatographic resin being in a form to substantially resolve said weak anions,

(b) directing the effluent containing said resolved weak anions and said strong acid from step (a) through a stripper column including a cation exchange resin in a form to remove the strong acid anion but not to disturb the resolution of the weak anions from the sample solution, and

(c) directing the effluent from step (b) containing said resolved weak anions through a conductivity cell having associated readout means.

4,242,098

TRANSPORT OF AQUEOUS COAL SLURRIES

David B. Braun, Ridgefield, Conn.; Stephen Drap, Pawling; Henry E. Fritz, Ossining, both of N.Y., and Arthur K. Ingberman, Bridgewater, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,807

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **13 Claims**

1. In an aqueous coal slurry composition comprising water and coal, the improvement of having present therein up to about 10 weight percent based on the total weight of the composition of a water-soluble polymer from the group consisting of hydroxyethyl cellulose, the quaternary nitrogen-substituted cellulose ethers, xanthan gum, hydroxypropyl guar gum and carboxymethyl hydroxypropyl guar gum.

4,242,099

FUEL ADDITIVE FOR DIESEL FUELS

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 9, 1979, Ser. No. 10,523

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—53 **8 Claims**

1. As a new composition of matter, an anti-wear compression ignition fuel for use in diesel engines comprising (1) a monohydroxy alkanol having from 1 to 5 carbon atoms, (2) an ignition accelerator, and (3) a wear inhibiting amount of a hydrocarbyl succinic acid or anhydride having from 12 to 30 carbon atoms.

4,242,100

MOTOR FUEL COMPOSITION

Donnie G. Parker, Bartlett, and James D. Milligan, Memphis, both of Tenn., assignors to Tri-Pak, Inc., Memphis, Tenn.

Filed Oct. 15, 1979, Ser. No. 84,568

Int. Cl.³ C10L *1/18, 1/20*

U.S. Cl. 44—53 **6 Claims**

1. A fuel composition comprising about 50 to about 70 parts by weight of methanol, about 10 to about 30 parts by weight of at least one alkyl substituted benzene having from 7 to 10 carbon atoms, about 0 to about 30 parts by weight of normal heptane, and about 2 to about 10 parts by weight of a chlorinated benzene.

4,242,101

FUELS FOR GASOLINE ENGINES

Hans-Henning Vogel, Frankenthal; Knut Oppenlaender, Ludwigshafen, and Klaus Starke, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 14, 1979, Ser. No. 48,478

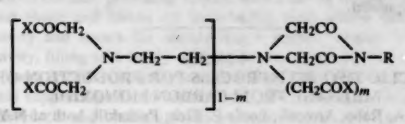
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1978, 2828038

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—58 **10 Claims**

1. An additive for gasoline fuels which comprises a combination of

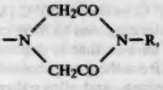
(a) imides or amide-imides, or mixtures of imides and amide-imides, obtained from nitrilotriacetic acid and/or from ethylenediaminetetraacetic acid and amines or amine mixtures of 7 to 18 carbon atoms, of the formula I



I

where the radicals X are identical or different radicals —HN—R, or adjacent radicals X are a radical

which completes a ring



m is 0 or 1 and R is an unbranched or branched aliphatic radical of 7 to 18 carbon atoms, as valve and carburetor cleaners, and (b) mixtures of highly hydrogenated petroleum distillates, in the boiling range of the kerosine fraction, and highly refined solvent raffinates with viscosities of from 50 to 500 mm^2/s at 40° C., the weight ratio of constituents (a) and (b) being from 20:80 to 80:20.

4,242,102

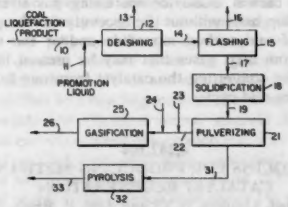
PRODUCTION OF GASIFIED PRODUCTS FROM ASH CONTAINING BITUMEN PRODUCED IN COAL LIQUEFACTION

George J. Snell, Fords, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Dec. 15, 1978, Ser. No. 969,725

Int. Cl.³ C10J *3/46*

U.S. Cl. 48—197 R **7 Claims**



1. In a process for the liquefaction of coal wherein an essentially ash free liquid coal fraction is separated from an ash containing heavy bitumen fraction, the improvement comprising:

subjecting said ash containing bitumen fraction to vacuum flashing to provide a residual product having a softening point of no less than 350° F. and no greater than 550° F.;

solidifying said residual product;

pulverizing the solidified residual product to a particle size such that 100 percent passes through a 100 mesh screen; and

employing said pulverized solidified residual product, without prior coking thereof as feed to an entrained bed gasifi-

cation process by entrainment in a gasification gas to produce gaseous product therefrom.

Reconsideration and allowance of this application are requested.

4,242,103

CYCLIC TWO STEP PROCESS FOR PRODUCTION OF METHANE FROM CARBON MONOXIDE

Jule A. Rabo, Armonk; Louis F. Elek, Peekskill, both of N.Y., and James N. Francis, Houston, Tex., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 889,558, Mar. 23, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,319

Int. Cl.³ C10K *3/04*

U.S. Cl. 48—197 R **62 Claims**

1. A cyclic two step process for the production of methane from carbon monoxide-containing gas streams comprising:

(a) passing a carbon monoxide-containing gas stream over a catalyst present in a metal state and capable of catalyzing the disproportionation of carbon monoxide at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 350° C., said carbon monoxide thereby being decomposed to form carbon dioxide and an active surface carbon that is deposited on said catalyst, which is taken from the group consisting of nickel, cobalt, ruthenium, rhenium, and alloys thereof, said gas stream being passed over the catalyst for a time sufficient to deposit a surface layer of said active surface carbon on the catalyst essentially without the subsequent formation of inactive coke thereon;

(b) contacting said layer of active surface carbon deposited on said catalyst present in a metal state with steam or a steam-containing gas stream at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 400° C., thereby converting said active surface carbon to methane and carbon dioxide, said methane being at least about 50% of the stoichiometric amount, the carbon thus recovered in the form of methane being at least about 12.5% of the carbon in said carbon monoxide decomposed upon contact with said disproportionation catalyst;

(c) passing additional carbon monoxide-containing gas over said catalyst from step (b) and repeating said steps (a) and (b) on a cyclic basis said catalyst being maintained substantially in its metal state during said repeated steps (a) and (b),

whereby relatively pure methane can conveniently be produced from carbon monoxide-containing gas streams on a cyclic two step basis without the necessity for the prior concentration of said carbon monoxide and/or the separation therefrom from inert gases that may be present in said gas streams or for converting the catalyst from one form to another between said cycles.

4,242,104

CYCLIC PROCESS FOR PRODUCING METHANE WITH CATALYST REGENERATION

Albert C. Frost, Congers, N.Y., and Alan P. Risch, New Fairfield, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 9, 1979, Ser. No. 82,472

Int. Cl.³ C10K *3/04*

U.S. Cl. 48—197 R **24 Claims**

1. In a cyclic process for the production of methane from carbon monoxide-containing gas streams in which a carbon monoxide-containing gas stream is passed over a catalyst present in a metal state and capable of catalyzing the disproportionation of carbon monoxide at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 350° C., with said carbon monoxide thereby being decomposed to form carbon dioxide and an active surface carbon that is deposited on said catalyst, and with said gas stream being passed over the catalyst for a time sufficient to deposit a surface layer of said active surface carbon on the catalyst essentially without the subsequent formation of inactive coke thereon, and in which said layer of active surface carbon deposited on said catalyst present in a metal state is contacted with steam or a steam-containing gas stream at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 400° C., thereby converting said active surface carbon to methane and carbon dioxide, with said methane being at least about 50% of the stoichiometric amount, with the carbon thus recovered in the form of methane being at least about 12.5% of the carbon in said carbon monoxide decomposed upon contact with said disproportionation catalyst and in which additional carbon monoxide-containing gas is passed over said catalyst and said steps are repeated on a two step cyclic basis, a process for the periodic regeneration of the catalyst employed in said cyclic process comprising:

(a) withdrawing said catalyst from use in said cyclic methanation process, on a periodic basis, upon reduction of the efficiency of the catalyst as a result of the deposition of inactive carbon thereon over the course of repeated use in said cyclic process;

(b) contacting said catalyst having inactive carbon deposited thereon with a CO_2-rich gas at a temperature in excess of about 500° F. but less than the degradation temperature of said catalyst, thereby converting said inactive carbon to CO, said regeneration reaction being endothermic and resulting in a decrease in the temperature of the gaseous regeneration effluent and the catalyst; and

(c) withdrawing said gaseous regeneration effluent from contact with said catalyst, whereby the inactive carbon deposited on said catalyst is effectively removed therefrom, the endothermic regeneration reaction eliminating the temperature control problems inherent in conventional burn off operations, the oxidation of the catalyst from its metal state being minimized and the long term stability of the catalyst being enhanced as the bulk thereof is not switched between the oxide form and the active metal form as the result of each said periodic regeneration of the catalyst.

4,242,105

PROCESS FOR PRODUCING METHANE FROM GAS STREAMS CONTAINING CARBON MONOXIDE AND HYDROGEN

Albert C. Frost, Congers, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 10, 1979, Ser. No. 83,473

Int. Cl.³ C10K *3/04*

U.S. Cl. 48—197 R **17 Claims**

1. A cyclic process for the production of methane from carbon monoxide-containing gas streams also containing appreciable quantities of hydrogen therein, said processs comprising:

(a) contacting a carbon monoxide and hydrogen-containing gas stream with air in a partial oxidation reaction zone, said air being employed in an amount such that, at the reaction temperature and pressure employed, the total partial pressure of hydrogen and oxygen in the reaction mixture is within the limits for non-explosive reaction of homogeneous mixtures of hydrogen and oxygen at said reaction conditions, thereby resulting in the selective oxidation of said hydrogen in preference to the carbon monoxide content of the reaction mixture;

(b) passing the resulting carbon monoxide-containing gas stream having hydrogen removed therefrom to a dehydration zone for the removal of water vapor therefrom;

(c) passing the carbon monoxide-containing gas stream removed from said dehydration zone over a catalyst present in a metal state and capable of catalyzing the disproportionation of carbon monoxide at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 350° C., said carbon monoxide thereby being decomposed to form carbon dioxide and an active surface

carbon that is deposited on said catalyst, which is taken from the group consisting of nickel, cobalt, ruthenium, thenium, and alloys thereof, said gas being passed over the catalyst for a time sufficient to deposit a surface layer of active surface carbon on the catalyst essentially without the subsequent formation of inactive coke thereon, the prior partial oxidation reaction and dehydration step serving to minimize methanation formation during said active surface carbon deposition;

(d) contacting said layer of active surface carbon deposited on said catalyst present in a metal state with steam or a steam-containing gas stream at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 400° C., thereby converting said active surface carbon to methane and carbon dioxide, said methane being at least about 50% of the stoichiometric amount, the carbon thus recovered in the form of methane being at least about 12.5% of the carbon in said carbon monoxide decomposed upon contact with said disproportionation catalyst; and

(e) passing additional carbon monoxide-containing gas, pretreated as in steps (a) and (b) above over said catalyst from step (d) and repeating said steps (c) and (d) on a two step cyclic basis,

whereby relatively pure methane can conveniently be produced from CO-containing gas streams on a cyclic two-step basis without the necessity for the prior concentration of said carbon monoxide and/or the separation thereof from inert gases or for converting the catalyst from one form to another between said cycles, the selective removal of hydrogen from the feed gas enhancing the active carbon deposition reaction and the overall efficiency of the methanation reaction.

4,242,106

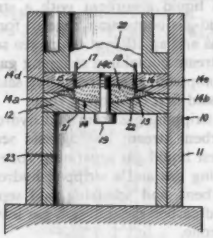
COMPOSITE OF POLYCRYSTALLINE DIAMOND AND/OR CUBIC BORON NITRIDE BODY/SILICON CARBIDE SUBSTRATE

Charles R. Morelock, Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1979, Ser. No. 639

Int. Cl.³ B24D *3/04, 3/10*

U.S. Cl. 51—307 **8 Claims**



1. A process for producing an integrally bonded composite of a polycrystalline diamond and/or cubic boron nitride body component and a supporting silicon carbide substrate component, which consists essentially of providing a crystal containing carbonaceous mass composed of at least a substantially uniform mixture of crystals selected from the group consisting of diamond, cubic boron nitride, and combinations thereof, and a carbonaceous material wherein none of the surfaces of said crystals are exposed significantly and wherein at least a substantial amount of said crystals are enveloped and separated from each other by at least a coherent continuous coating of said carbonaceous material on said crystals, said carbonaceous material being selected from the group consisting of elemental non-diamond carbon, an organic material, and mixtures thereof, providing a supporting silicon carbide substrate consisting essentially of a hot-pressed or sintered polycrystalline silicon carbide body wherein the silicon carbide grains are bonded directly to each other and which ranges in density from about 30% to about 100% of the theoretical density of silicon carbide, providing a mold with a cavity of desired size and shape and means for introducing fluid silicon into said cavity and means for maintaining a partial vacuum in said cavity, filling said cavity with a preform consisting essentially of said crystal-containing carbonaceous mass in contact with said supporting silicon carbide substrate forming an interface therewith and confining said preform therein, said preform being the form desired of said composite, said organic material decomposing at a temperature below 1400° C. to elemental non-diamond carbon and gaseous product of decomposition, said organic material being present in an amount sufficient on decomposition to produce on the crystal surfaces it coats at least a coherent continuous coating of elemental non-diamond carbon, and at least sufficient elemental non-diamond carbon to maintain said preform, associating said confined preform in said mold cavity with a mass of solid silicon via said means for introducing fluid silicon into said mold cavity, providing the resulting associated structure with a partial vacuum wherein the residual gases have no significant deleterious effect on said associated structure, heating said associated structure in said partial vacuum to a temperature above 1400° C. at which said silicon is fluid and which does not have a significantly deleterious effect on said crystals, introducing said fluid silicon to said confined preform via said means for introducing fluid silicon into said cavity, and infiltrating said fluid silicon into said preform at least through said crystal-containing carbonaceous mass and at least into contact with the contacting surface of said substrate filling the pores through said interface so that it is at least substantially pore-free, said partial vacuum being at least sufficient to remove gas from said preform which blocks said infiltrating fluid silicon, said infiltrating silicon reacting with non-diamond elemental carbon forming silicon carbide, cooling the resulting composite in an atmosphere which has no significant deleterious effect on it, recovering the resulting integrally bonded composite of polycrystalline diamond and/or cubic boron nitride body component and supporting substrate component, said polycrystalline body component being substantially pore-free wherein the diamond and/or cubic boron nitride crystals ranging from about 1% by volume up to about but less than 80% by volume of the total volume of said polycrystalline body are bonded together by a bonding medium comprised of silicon carbide and elemental silicon.

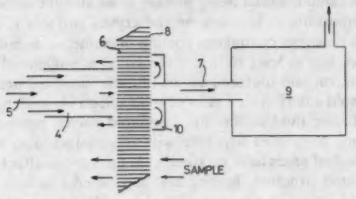
4. A self-supporting composite consisting essentially of a polycrystalline diamond and/or cubic boron nitride body component integrally bonded to a supporting silicon carbide substrate, said polycrystalline body component being comprised of crystals selected from the group consisting of diamond, cubic boron nitride and mixtures thereof adherently bonded together by a bonding medium consisting essentially of silicon carbide and elemental silicon wherein the volume of said silicon carbide and said silicon each is at least about 1% by volume of said polycrystalline body component, said crystals ranging in size from submicron up to about 2000 microns, the volume of said crystals ranging from about 1% by volume to about but less than 80% by volume of said polycrystalline body component, said bonding medium being present in an amount ranging up to about 99% by volume of said polycrystalline body component, said bonding medium being distributed at least substantially uniformly throughout said polycrystalline body component, the portion of said bonding medium in contact with the surface of said crystals being silicon carbide, said polycrystalline body component being at least substantially pore-free, said silicon carbide substrate consisting essentially of a hot-pressed or sintered polycrystalline silicon carbide body wherein the silicon carbide grains are bonded directly to each other and which ranges in density from about 30% to about 100% of the theoretical density of silicon carbide, said bonding medium extending into contact with said silicon carbide substrate.

4,242,107

APPARATUS FOR THE SEPARATION OF A CONSTITUENT FROM AN ATMOSPHERE

Anthony Jenkins, Analytical Instruments Limited, London Rd., Pampisford, Cambridge, England

Continuation of Ser. No. 800,054, May 24, 1977, abandoned.
This application Aug. 7, 1978, Ser. No. 931,402
Claims priority, application United Kingdom, May 25, 1976, 21551/76
Int. Cl.³ B01D *53/08*
U.S. Cl. 55—18 6 Claims



1. A method of continuously detecting a component of interest from a multi-component gaseous sample which comprises rotating a disc having a matrix of channels extending between the opposite faces thereof about its axis normal to said faces to move the channels through at least first and second regions, drawing a sample flow through the channels moving across the first region to trap the component of interest, arranging carrier gas flow means at the second region close to but spaced from the opposite faces of the disc to provide clearances for the rotary movement of the disc therebetween, subjecting the channels to a flow of carrier gas and heat at the second region to expel the component of interest, channeling said expelled flow of carrier gas and component of interest to a detector means for detecting the component of interest in the carrier gas flow while simultaneously allowing a portion of the flow at the second region to escape outwardly through the clearances to create a gaseous barrier against ingress of atmosphere into the second region, the flow of sample through the first region being greater than the flow of carrier gas through the second region whereby to obtain a concentration gain of the component of interest in the carrier gas flow from the second region.

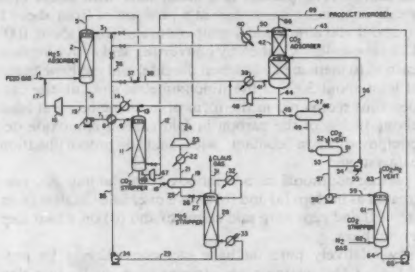
2. An apparatus for effecting the continuous detection of a component of interest from a multi-component gaseous sample comprising: a detector means; and a separation means, operatively connected to said detector means, for continuously separating said component of interest from said multi-component gaseous sample, said separation means including a rotatable disc having a matrix of channels between the opposite faces of the disc, each channel constituting a trap for releasably retaining the component of interest, means for rotating the disc about its axis normal to said faces to move the channels through at least first and second regions, means at the first region to draw a flow of sample through the channels moving across the first region to trap the component of interest, means at the second region to draw a flow of carrier gas through the channels moving across the second region and into said detector means and means for heating the channels to release the component of interest, with the flow means at the second region being close to but spaced from the opposite faces of the disc to provide clearances for the rotary movement of the disc therebetween and to enable a portion of the carrier flow to escape outwardly through said clearances whereby to provide a gaseous barrier against ingress of atmosphere into the second region.

4,242,108

HYDROGEN SULFIDE CONCENTRATOR FOR ACID GAS REMOVAL SYSTEMS

David M. Nicholas, New Tripoli, and William P. Hegarty, Wescosville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 7, 1979, Ser. No. 91,882
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—40 11 Claims



1. A method of removing hydrogen sulfide from a contaminated gas mixture comprising hydrogen sulfide, carbon dioxide, and a gas selected from the group consisting of hydrogen, methane, and a mixture of hydrogen and carbon monoxide, which method comprises:

(a) contacting said contaminated gas mixture with a liquid absorbent in a first liquid-gas contacting zone to absorb said hydrogen sulfide and form a hydrogen sulfide rich liquid absorbent and an overhead gas, and thereby absorbing a portion of said carbon dioxide,

(b) removing carbon dioxide from said overhead gas leaving said first contacting zone in a carbon dioxide absorber to form a product gas,

(c) heating said hydrogen sulfide rich liquid absorbent leaving said first contacting zone to form a heated hydrogen sulfide rich liquid absorbent,

(d) stripping carbon dioxide from said heated hydrogen sulfide rich liquid absorbent with a stripping gas in a second liquid-gas contacting zone to form a carbon dixoide rich gas and an effluent hydrogen sulfide rich liquid absorbent stream containing stripping gas,

(e) cooling, compressing, and recycling said carbon dioxide rich gas to said first contacting zone,

(f) separating stripping gas from said hydrogen sulfide rich liquid absorbent stream leaving said second contacting zone in a first liquid-gas separating zone to form a separated stripping gas and a stripped hydrogen sulfide rich liquid absorbent, and admixing said separated stripping gas with said carbon dioxide rich gas leaving said second contacting zone,

(g) separating hydrogen sulfide from said stripped hydrogen sulfide rich liquid absorbent leaving said first separation zone in a second liquid-gas separation zone to form hydrogen sulfide gas and purified liquid adsorbent, and

(h) recycling said purified liquid absorbent from said second liquid-gas separation zone to said first liquid-gas contacting zone with from 0 to 100 percent of said purified liquid adsorbent being recycled passing first through said carbon dioxide absorber.

4,242,109

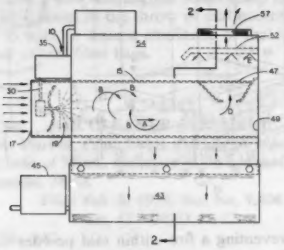
AIR CLEANER AND HUMIDIFIER

John W. Edwards, 8220 Doe Ave., Visalia, Calif. 93277

Filed Jun. 29, 1979, Ser. No. 53,355
Int. Cl.³ B01D *47/08*
U.S. Cl. 55—230 7 Claims

1. Apparatus for cleaning particulate laden air and humidifying the same comprising a housing, means defining a tubular

chamber extending longitudinally of said housing, a fan disposed at one end of the chamber, motor means, including a rotating shaft for driving said fan, said fan mounted on said shaft and disposed at one end of said chamber for pulling particulate laden air into said chamber, and for moving said air in a vortical flow pattern through said chamber, means disposed on such shaft forward of said fan and at the center of the vortex generated thereby for injecting water vapor into said vortical flow for wetting the particulate in said air flow thereby causing the particulate to be forced outwardly and against the walls of the chamber, means defining a longitudinal



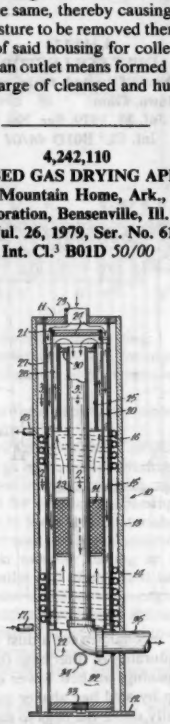
slot in the bottom of said chamber to permit moisture laden particulate scrubbed from the air flow to be gravitationally dispersed from said chamber, means defining a vertically disposed discharge funnel near the end of the chamber remote from said fan for permitting discharge of air from said chamber, means for deflecting the flow of said discharged air to further decelerate the same, thereby causing additional particulate matter and moisture to be removed therefrom, a collector defined at the base of said housing for collecting excess moisture and particulate, an outlet means formed in said housing for permitting the discharge of cleansed and humidified air therefrom.

4,242,110

COMPRESSED GAS DRYING APPARATUS

William M. Hynes, Mountain Home, Ark., assignor to Miller Fluid Power Corporation, Bensenville, Ill.

Filed Jul. 26, 1979, Ser. No. 61,652
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—269 **2 Claims**



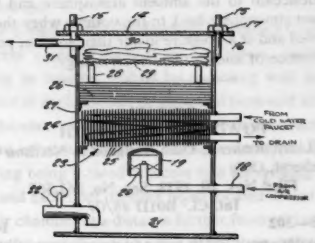
1. A compressed air drying apparatus comprising a vertically arranged cylindrical vessel having a top and a bottom, an exterior casing forming the outer cylindrical surface of the vessel, an interior cylindrical casing spaced inwardly from the outer casing with both of said casings extending from top to bottom of the vessel, refrigeration coils in the space between the casings and in heat transfer relationship with the outer surface of the inner casing, a first cylindrical wall interiorly spaced from the inner casing and concentric therewith with the upper end of said first wall being spaced downwardly from the top of the vessel and with the lower end of said first wall being spaced upwardly from the bottom of said vessel, an inlet at the top of said vessel and opening into the interior thereof above the upper end of the first wall, a closure over the upper end of the first wall to deflect air entering through the inlet into the space between the inner casing and the first wall, a second cylindrical wall mounted within and spaced from the first cylindrical wall, said second wall being relatively short and having its upper end near but spaced downwardly from said closure, a multi-surface heat exchanger in the vessel having a first portion in the space between the inner casing and the first cylindrical wall and a second portion in the space between the first cylindrical wall and the second cylindrical wall, a discharge pipe within but spaced from the second cylindrical wall and having its upper open end near the top of the second cylindrical wall, the exterior surface of said pipe being sealed to the interior of the second wall, said pipe extending downwardly through the vessel to a point below the lower end of said first wall, a demister in the vessel below the lower end of the second wall and mounted to fill the space between the exterior surface of the pipe and the interior surface of the first wall, a sump at the bottom of the vessel and means connected to the lower portion of the pipe for conducting dried air outwardly of the vessel whereby compressed air entering the vessel through the inlet is deflected by said closure for passage downwardly in the space between the inner casing and the first wall and through the first portion of the heat exchanger to the lower end of said first wall thence upwardly in the space between the pipe and the first wall through the demister into the space between the first and second walls where it passes through the second portion of the heat exchanger and thereafter downwardly through said pipe to the exterior of the vessel.

4,242,111

COMPRESSED AIR DRYER

Andrew Arends; Gary W. Arends, and George Spector, all c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 16, 1979, Ser. No. 21,017
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—269 **1 Claim**



1. A compressed air dryer, comprising in combination, a canister having a removable cover closing an open upper end thereof, an inlet pipe having an upturned portion positioned in a lower end of said cannister, an outlet pipe positioned near an upper end of said canister, and means inside said canister for dehumidifying air moving through said pipes, said means including an inverted splatter cup mounted over said upturned portion of said inlet pipe, said cup including a side wall encompasing and extending below said portion, coiled finned cooling

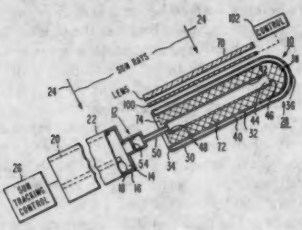
tubes mounted above said cup for cooling the air and condensing the moisture in the air, a screen filter mounted above said tubes, spacers mounted on said filter, wire mesh supported by said spacers above said screen filter and a cloth remnant on said mesh, said outlet pipe being located above said mesh and remnant.

4,242,112

SOLAR POWERED DEHUMIDIFIER APPARATUS

Robert W. Jebens, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,528
Int. Cl.³ B01D *53/28*
U.S. Cl. 55—269 **5 Claims**



1. A solar energy operated dehumidifier apparatus comprising:

a housing containing a volume of air to be dried,

a thermally insulated conduit means in fluid communication with said volume of air and the ambient atmosphere,

said conduit means including light transmitting wall means for transmitting incident solar energy within a conduit formed by said conduit means,

a solar energy absorbing desiccant in said conduit receptive to said transmitted solar energy for converting said solar energy to heat and thereby drying said desiccant, said desiccant being positioned so that air passing between said volume and the ambient engages said desiccant, and

valve means including means for connecting said valve means between said conduit means and a volume to be dried, said valve means being normally closed and responsive to pressure differentials which may exist between said volume to be dried and the ambient atmosphere for passing air from said volume when heated by said solar energy and at a pressure greater than ambient pressure through said desiccant to the ambient atmosphere and from the ambient atmosphere back to the volume when the volume is cooled and at a pressure lower than ambient pressure in the absence of said incident solar energy.

4,242,113

POWDER SPRAY BOOTH

Gunter J. Lissy, Amherst, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Nov. 20, 1978, Ser. No. 962,507
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—302 **14 Claims**

1. A powder spray booth and powder recovery/static filter unit configuration comprising:

booth means providing a controlled area in which to powder coat substrates, defined generally by a ceiling, side and end walls, and a floor;

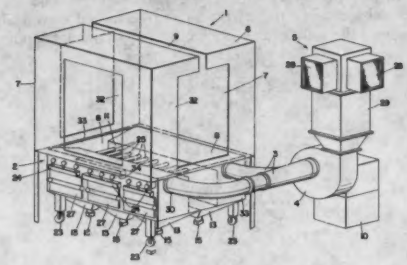
a powder collection chamber in close proximity to the booth;

means for removing collected powder from the bottom of said powder collection chamber,

a clean air chamber sealed from the booth and from the powder collection chamber, said clean air chamber being provided with an opening from the powder collection chamber into said clean air chamber;

static filter means located within said powder collection chamber and operative to effectively prevent powder from entering said clean air chamber;

blower means operative to create a negative pressure in said clean air chamber; and



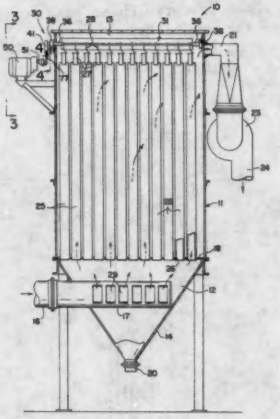
means for preventing a fire within said powder collection chamber from causing an explosion, said explosion prevention means including a substantially unrestricted flow path leading directly from said powder collection chamber into said booth operative to effectively vent any fire created pressure build-up within said powder collection chamber into said booth without the occurrence of an explosion.

4,242,114

DUST COLLECTOR

James S. Deacon, North Olmsted, Ohio, assignor to McLaughlin, Inc., Middletown, Ohio

Filed Jul. 11, 1979, Ser. No. 56,783
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—304 **4 Claims**



1. In a bag shaker mechanism for a dust collector system of the type that uses a plurality of filter bags that receive particle-laden air through openings at their lower ends and which are supported at the top by said bag shaker mechanism which is adapted to periodically shake the bags to dislodge and remove accumulated dust, said bag shaker mechanism comprising bag support means, eccentric means operatively associated with said bag support means and a rotary drive motor with a shaft operatively connected to drive said eccentric means to pro-

duce a sinusoidal shaking of said filter bags, the improvement wherein said eccentric means comprises:

a hub having means at one end by which said hub is secured to said motor shaft, and having a bore at its other end with its axis offset from the axis of said shaft;

a crank arm member with a cylindrical main body at one end adapted to be received in said bore of said hub and with a crank pin on the other end thereof with its axis offset from the axis of said main body; and

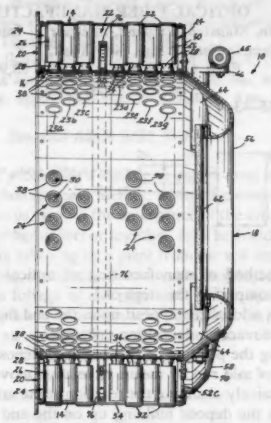
means on said cylindrical main body and said bore for releasably securing said cylindrical main body in said bore coaxially therewith selectively in any one of a plurality of positions of different angular relationship to permit selective adjustment of the throw of said eccentric means and thus to select a desired amplitude of shaking motion imparted to said filter bags.

4,242,115

AIR CLEANER ASSEMBLY

Donald M. Harold, Prior Lake, and Gregory A. Ufken, Apple Valley, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Feb. 5, 1979, Ser. No. 9,404
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—347 **26 Claims**



1. An air cleaner assembly comprising:

a plurality of interconnected wall members;

a scavenging air chamber defined between said wall members;

a plurality of centrifugal separators supported in said scavenging air chamber;

each of said centrifugal separators including a first tubular member having an inlet end for admitting air and an outlet end in fluid communication with said scavenging air chamber, means for swirling air passing through said first tubular member to force solid materials carried by said air against the inner wall surface of said tubular member, and a second tubular member having an inlet end disposed adjacent said outlet end of said first tubular member and an outlet end exterior of said scavenging air chamber;

a scavenging air outlet port formed through one of said wall members and adapted to be coupled to a negative pressure source for drawing scavenged air and solid materials intermixed therewith from said scavenging air chamber; and

at least one discrete conduit disposed within said scavenging air chamber, said at least one conduit having an interior defined by enclosing wall means, the interior of said at least one conduit being sealed from said scavenging air chamber except for an inlet opening to said at least one conduit and an exhaust opening from said at least one conduit, said exhaust opening being adjacent said scavenging air outlet port and said inlet opening being located in said scavenging air chamber at a distance further from said scavenging air outlet port than said exhaust opening whereby negative pressure applied through said scavenging air outlet port is staged to enhance the separating efficiency of the assembly.

20. An air cleaner assembly comprising:

a housing including a first cylindrical wall member having a first diameter, a second cylindrical wall member having a second diameter less than said first diameter, said second cylindrical wall member being supported within said first cylindrical wall member, and a pair of opposing cover wall members attached to said first and second cylindrical wall members;

a generally ring-shaped scavenging air chamber defined between said wall members;

a plurality of centrifugal separators supported in said cylindrical chamber, each of said separators having a longitudinal dimension extending generally radially between said first and second cylindrical wall members, said separators being aligned in a plurality of rows;

each of said centrifugal separators including a first tubular member having an inlet end for admitting air and an outlet end in fluid communication with said scavenging air chamber, means to swirl air passing through said first tubular member to force solid materials carried by said air against the inner wall surface of said tubular member, and a second tubular member having an inlet end disposed adjacent said outlet end of said first tubular member and an outlet end exterior of said scavenging air chamber, said inlet end of said first tubular member being disposed at said first cylindrical wall member and said outlet end of said second tubular member being disposed at said second wall member;

a scavenging air outlet port formed through said first cylindrical wall member and being adapted to be coupled to a negative pressure source for drawing scavenging air and solid materials intermixed therewith from said scavenging air chamber;

a pair of discrete conduits disposed between a single pair of adjacent rows of centrifugal separators, each conduit having an interior defined by enclosing wall means, the interior of each conduit being sealed from said scavenging air chamber except for an inlet opening to each conduit and an exhaust opening from each conduit, each exhaust opening being located adjacent said scavenging air outlet port and each inlet opening being located in said scavenging air chamber at a distance further from said scavenging air outlet port than said exhaust openings whereby negative air pressure applied through said scavenging air outlet port is staged to enhance the separating efficiency of the assembly, each of said conduits having a generally curved shape conforming to the shape of said scavenging air chamber, a space being formed between the second ends of said conduits, and at least a portion of said space being disposed approximately 180° from said scavenging air outlet port.

4,242,116

MAGNETIC VALVE, ESPECIALLY THREE-WAY VALVE AS A SWITCHING DEVICE FOR MULTI-TEMPERATURE COOLING APPARATUS WITH ONLY ONE REFRIGERATION MACHINE

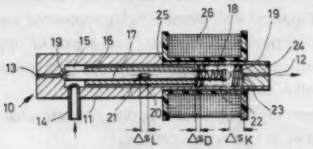
Matthias Aschberger, and Dieter Link, both of Giengen, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1978, Ser. No. 906,632

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723365

Int. Cl.³ F25B 5/00

U.S. Cl. 62—199 **14 Claims**



1. Magnetic valve, especially three-way valve as a switching device for multi-temperature cooling apparatus operated with only one refrigeration machine, comprising:

(a) a tubular valve housing

(b) an axial bore hole in said tubular valve housing

(c) an inlet in said tubular housing for the introduction of fluid to said axial bore hole

(d) an opening at each end of the tubular valve housing for the discharge of fluid from said axial bore hole

(e) a single rod-like plunger axially movable in the bore hole of said tubular valve housing

(f) a sealing member at each end of the single rod-like plunger with axial movement of the plunger in one direction causing closing of one said opening at one end of the tubular valve housing by the sealing member at the end of the plunger, and with axial movement of the plunger in the opposite direction causing opening of said closed opening and closing of the other opening at the opposite end of the housing by the other sealing member at the opposite end of the plunger

(g) a coil of an electromagnet mounted on the tubular valve housing

(h) an armature axially movable in the housing which when activated by energizing said coil of the electromagnet engages and moves said plunger and attached sealing members against a restoring force and

(i) a spring in said housing in engagement with said plunger-sealing members to provide said restoring force.

4,242,117

METHOD OF PRODUCING OPTICAL FIBERS FOR TELECOMMUNICATIONS

Henricus M. J. M. van Ass, Hillegom, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

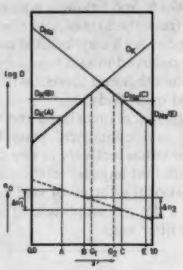
Filed Dec. 26, 1978, Ser. No. 973,277

Claims priority, application Netherlands, Jan. 6, 1978, 7800157

Int. Cl.³ G02B 5/14; C03C 25/02

U.S. Cl. 65—3 A **4 Claims**

1. A method of producing a glass fiber containing an alkali metal oxide and having a graded refractive index profile, said method being of the type wherein a core glass, having an initial composition containing a first type of alkali metal ions, and a cladding glass, having an initial composition containing a second type of different alkali metal ions, are contacted and heated to cause diffusion of the two types of alkali metal ions therein, thereby resulting in an alkali metal ion exchange between the core glass and the cladding glass, CHARACTERIZED IN THAT in the initial core glass composition prior to diffusion part of the first type of alkali metal ions are equimolarly replaced by alkali metal ions of the second type in an



amount such that after diffusion a fiber having a substantially parabolic refractive index profile is obtained.

4,242,118

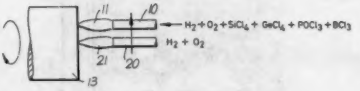
OPTICAL FIBER MANUFACTURE

John Irven, Stansted, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,914

Int. Cl.³ C03C 25/02

U.S. Cl. 65—3 A **16 Claims**



1. A method of manufacturing an optical fiber solid rod preform comprising the steps of:

forming a localized deposit upon the end face of a rod by a vapor reaction deposition process;

scanning the position of the localized deposit over the end face of said rod by means of relative movement; and

progressively changing the reaction at the same time so as to cause the deposit building up on the end face to have a radially graded refractive index profile.

4,242,119

AGENT FOR COMBATING SEA-WATER ALGAE

Dagmar Berrer, Riehen, Switzerland; Joachim Lorenz, Bensheim, and Reinhardt Grade, Zwingenberg-Rodau, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,138

Claims priority, application Switzerland, Feb. 3, 1978, 1212/78

Int. Cl.³ A01N 43/70; C09D 5/14

U.S. Cl. 71—67 **5 Claims**

1. A method of combatting sea-water algae which consists essentially of

adding an effective amount of a triazine selected from the group consisting of 2-methylthio-4-cyclopropylamino-6-(α,β-dimethylpropylamino)-s-triazine (I); 2-methylthio-4-cyclopropylamino-6-tert-butylamino-s-triazine (II); and 2-methylthio-4-ethylamino-6-(α,β-dimethylpropylamino)-s-triazine (III) to sea-water in a sea-water cooling system or to a composition or material to be exposed to sea-water.

4,242,120

METHOD FOR STIMULATING FRUCTIFICATION AND FRUIT GROWTH OF CULTIVATED PLANTS AND GIBBERELLIN-BASED PREPARATION FOR REALIZING SAME

Mikhail K. Manankov, Krymskaya, U.S.S.R., assignor to Simferopolsky Gosudarstvenny Universitet imeni M.V., Yaltinskaya, U.S.S.R.

Filed Dec. 20, 1978, Ser. No. 971,630
Claims priority, application U.S.S.R., Feb. 23, 1978, 2595951
Int. Cl.[3] A01N *43/08*
U.S. Cl. 71—89 6 Claims

1. A method for stimulating the fruitification and fruit growth of cultivated plants, comprising locally applying an effective amount of a preparation containing gibberellin and low molecular weight carbohydrate to individual parts of plants adjacent to reproductive organs during the period of active fruit formation.

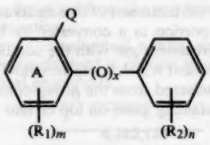
4,242,121

METHOD OF ANTAGONIZING HERBICIDES ON SOYABEAN AND COTTON

Alan F. Hawkins, Woodley; Terence Lewis, Bracknell, and Ian Jones, Camberley, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 784,638, Apr. 4, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,880
Claims priority, application United Kingdom, Apr. 8, 1976, 14355/76
Int. Cl.[2] A01N *9/22, 9/24*
U.S. Cl. 71—93 6 Claims

1. A method of protecting a legume or cotton crop in a locus from herbicidal damage, said method consisting essentially of applying to the locus prior to the emergence of the crop, either successively (in either order) or together, (a) a herbicide which is capable of being taken up by a plant from the soil and which is capable of being translocated to a main herbicidal site of action within the foliage of the plant and which operates by interfering with photosynthesis in said plant, and (b) an effective amount of an antidotally active compound of general formula (I):



(I)

wherein each of R_1 and R_2, which may be the same or different, is hydrogen, halogen, C_{1-3} alkoxy, C_{1-4} alkyl, trihalomethyl or hydroxy, Q is carboxy or a salt or ester thereof, x is 1, m is 1 or 2 and n is 1 or 2.

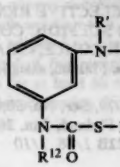
4,242,122

HERBICIDAL META-BIFUNCTIONAL BENZENES

Philip C. Hamm, Glendale, and John F. Olin, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

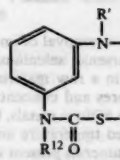
Division of Ser. No. 549,128, Feb. 11, 1975, Pat. No. 4,013,450, which is a division of Ser. No. 77,677, Oct. 2, 1970, Pat. No. 3,867,426. This application Nov. 24, 1976, Ser. No. 744,849
Int. Cl.[3] A01N *37/100*; C07C *155/08*
U.S. Cl. 71—100 13 Claims

1. A meta-bifunctional substituted benzene having the formula



wherein R' is selected from the group consisting of hydrogen and alkyl having a maximum of 8 carbon atoms; R^2 is alkyl having a maximum of 12 carbon atoms; R^3 is selected from the group consisting of hydrogen and alkyl having a maximum of 12 carbon atoms; R^{12} is selected from the group consisting of hydrogen, alkyl having a maximum of 6 carbon atoms; and R^{13} is selected from the group consisting of alkyl having a maximum of 8 carbon atoms.

11. A herbicidal method which comprises applying to plants a herbicidal effective amount of a meta-bifunctional substituted benzene of the formula



wherein R' is selected from the group consisting of hydrogen, alkyl having a maximum of 8 carbon atoms; R^2 is alkyl having a maximum of 12 carbon atoms; R^3 is selected from the group consisting of hydrogen and alkyl having a maximum of 12 carbon atoms; R^{12} is selected from the group consisting of hydrogen, alkyl having a maximum of 6 carbon atoms; and R^{13} is selected from the group consisting of alkyl having a maximum of 8 carbon atoms.

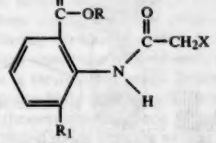
4,242,123

HERBICIDAL COMPOSITION AND METHOD OF USE

John P. Chupp, Kirkwood, and Jimmy W. Worley, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 30, 1978, Ser. No. 965,354
Int. Cl.[3] A01N *37/44*
U.S. Cl. 71—111 5 Claims

1. A herbicidal composition comprising an inert adjuvant and an effective amount of a compound of the formula



wherein X is chlorine and R and R_1 are independently C_{1-5} alkyl.

4,242,124

PROCESS FOR THE SELECTIVE REMOVAL OF IMPURITIES PRESENT IN SULFIDIC COMPLEX ORES, MIXED ORES OR CONCENTRATES

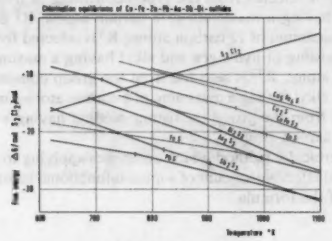
Simo A. I. Mäkipirtti, Nakkila, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed Jun. 21, 1979, Ser. No. 50,689

Claims priority, application Finland, Jun. 26, 1978, 782034

Int. Cl.³ C22B *1/08, 1/10*

U.S. Cl. 75—6 **7 Claims**



1. A process for the selective removal of impurities selected from the group comprising arsenic, selenium, bismuth, tellurium, and antimony, present in a raw material selected from sulfidic complex and mixed ores and concentrates containing copper, cobalt, nickel and iron as main metals, by decomposing and rearranging, at an elevated tmperature and a high partial pressure of elemental sulfur, minerals present in the raw material, in order to form new impurity compounds which pass into the gas phase, comprising subjecting the raw material to a gas atmosphere which, in addition to sulfur, contains a sulfur halide in order to halogenate the impurity compounds which have passed into the gas phase, and form stable halides which no longer affect the vaporization equilibrium.

4,242,125

CARBOTHERMIC PROCESS FOR PRODUCING SPONGE IRON AND THE IMPROVED VERTICAL RETORT SYSTEM USED IN SAID PROCESS

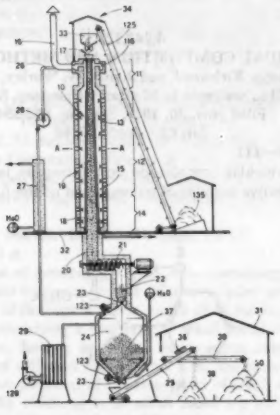
Franco Colautti, Ragosa di Povoletto, Italy, assignor to Kinglor Metor S.p.A., Buttrio, Italy

Filed Nov. 17, 1978, Ser. No. 961,689

Claims priority, application Italy, Nov. 22, 1977, 83525 A/77

Int. Cl.³ C21B *13/02*

U.S. Cl. 75—37 **22 Claims**



1. A carbothermic process for reducing iron ore in an externally heated vertical retort which includes a reduction zone; means above the reduction zone for receiving a reaction mixture of coal and ore and a cooling zone below the reduction zone including means to withdraw sponge iron, excess coal and ashes from the vertical retort, comprising the steps of first pre-heating a reaction mixture of coal and ore, with a substantially constant thermal charge, said pre-heating being carried out with a constant speed of descent of the mixture within a first zone of said retort, said pre-heating of the mixture being carried out with the combustion gases generated by the carbothermic process; a second and progressive heating of said reaction mixture in a second zone of said retort following said pre-heating, said second and progressive heating being by means of external burners to initiate the reaction and first reduction of said mixture, the speed of descent of said mixture being controlled to become progressively slower and the thermal charge being substantially constant; a third and constant heating of said mixture in a third zone of said retort following said progressive heating, said constant heating being by means of external burners to maintain the heat in said third zone so as to complete the reduction process, the speed of descent of said mixture in said third zone being substantially the same as the speed of descent in the second zone, and the thermal charge being substantially constant; maintaining the outside temperature of said second and third zones of said retort substantially constant in at least part of the second zone and in the third zone while maintaining the outside temperature of said retort at the second zone higher than the outside temperature of said retort at the third zone; withdrawing the sponge iron from said cooling zone in order that the momentary speed of descent of said mixture within said retort is constant at every point in any one single horizontal section, and withdrawing the at least partially cooled sponge iron from the retort together with excess coal.

4,242,126

PROCESS FOR THE TREATMENT OF IRON MELTS AND FOR INCREASING THE SCRAP PORTION IN THE CONVERTER

Alfred Freissmuth, Trostberg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,734

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—51 **14 Claims**

1. In a process for the treatment of iron melts and for increasing the scrap iron portion in a converter by blowing in an oxygen-containing treatment gas with the addition of calcium carbide, the improvement which comprises blowing in calcium carbide with a gas selected from the group consisting of oxygen and oxygen-containing gases on top or into the iron melt.

4,242,127

PROCESS FOR TREATING HYDROXIDE SLUDGE RESIDUES CONTAINING NONFERROUS METALS

Wolfgang Müller, Mannheim-Rheinau, and Lothar Witzke, Brühl, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt Ag, Essen, Fed. Rep. of Germany

Filed Sep. 19, 1979, Ser. No. 77,138

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841271

Int. Cl.³ C22B *15/08, 19/22, 23/04*

U.S. Cl. 75—99 **9 Claims**

1. A method for treating hydroxide sludge residues containing nonferrous metals selected from the group consisting of chromium, copper, zinc and nickel, and recovering the nonferrous metals by the separation of the individual nonferrous metals from one another comprising the following consecutive steps:

(a) concentrating the residue to an aqueous suspension with 15 to 20 weight percent of solids, treating this suspension with ca. 96% sulfuric acid at pH values equal to or less

than 2 and temperatures of 10° to 70° C. for 0.5 to 2 hours, and separating the acid-insoluble residue obtained;

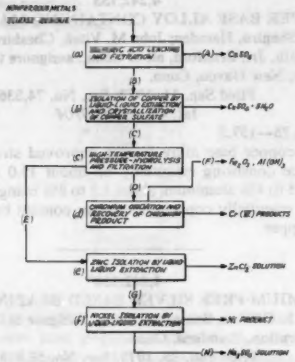
(b) isolating the copper from this solution by liquid extraction and further processing the copper-free solution by

(c) precipitating the aluminum-III, iron-III, chrominum-III, and calcium portions as the hydrated oxides or basic sulfates by treating the copper-free solution at pH values of 0.8 to 3, temperatures of 150° to 260° C., under a pressure of 6 to 48 bars for 1 to 3 hours and rapidly cooling the reaction mixture, and then subsequently neutralizing the resultant suspension with conventional neutralizing agents to produce

(c_1) an insoluble hydrolysate and

(c_2) a neutralized solution,

(d) mixing an alkali hydroxide and/or alkali carbonate with



insoluble hydrolysate (c_1) in at least stoichiometric amounts, based on the chromium content of the hydrolysate sludge, drying the mixture at temperatures less than 200° C. and roasting the dry mass with the addition of air at temperatures from 400° to 800° C. or with the addition of oxygen at 200° to 400° C. during 0.5 to 3 hours and subsequently adding the hot roasted material to water, leaching out the water-insoluble residue and then isolating the alkali chromate formed by filtration;

(e) isolating the zinc by liquid-liquid-extraction from the neutralized solution (c_2);

(f) isolating the nickel from the remaining solution by liquid-liquid extraction;

and processing the individual nonferrous metal fractions to isolate the metals obtained in process steps (b), (d), (e), and (f) by conventional procedures.

4,242,128

REMOVAL OF DISSOLVED COPPER FROM AQUEOUS SOLUTION ALSO CONTAINING DISSOLVED COBALT OR MANGANESE

Walter Partenheimer, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 15, 1979, Ser. No. 3,366

Int. Cl.³ C22B *15/12*

U.S. Cl. 75—109 **1 Claim**

1. The method of decreasing the concentration of dissolved copper in an aqueous solution obtained from the aqueous extraction of a residue from the production of a phthalic acid product by the liquid phase oxidation of a xylene with air in the presence of cobaltous ion or mixtures of cobaltous and manganous ions in the presence or absence of reaction solvent wherein said residue remains after recovery of the phthalic acid product and, if used, separation of reaction solvent; wherein said extract solution contains mainly dissolved cobalt or cobalt and manganese together with a small fraction thereof of the contaminant metals copper, iron, nickel and chromium as their phthalates; and wherein the concentration of dissolved copper is at or above 800 weight parts per million weight parts of cobalt; which copper decreasing method comprises adjusting the pH of such solution to a pH between 5.8 and 6.5, contacting such pH adjusted solution with particulates of iron in an amount thereof of five weight parts for each 140 weight parts of solution for at least 30 minutes but less than 120 minutes and thereafter separating the solution from the iron particulates.

4,242,129

METHOD OF RECOVERING METALS

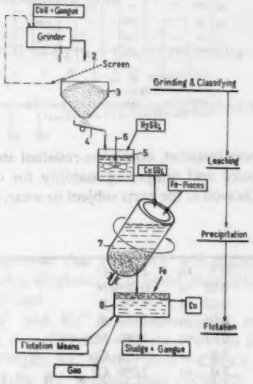
Hans Kellerwessel, Aachen, Fed. Rep. of Germany, and Ernst Kausel, Lima, Peru, assignors to Klöckner-Humboldt-Wedag AG, Fed. Rep. of Germany

Continuation of Ser. No. 759,138, Jan. 13, 1977, abandoned. This application May 26, 1978, Ser. No. 909,964

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602849

Int. Cl.³ C22B *3/00, 3/02*

U.S. Cl. 75—109 **2 Claims**



1. The method of recovering copper from low grade copper oxide sources which comprises grinding solid copper oxide source material to a size larger than is suitable for flotation, continuously feeding the ground copper source material through an oscillating reaction vessel, adding an aqueous sulphuric acid leaching solution to the ground copper source material in the reaction vessel, commingling the sulphuric acid leaching solution and the ground copper source material in the reaction vessel with iron grinding bodies effective to precipitate copper from the leaching reaction of the sulphuric acid leaching solution on the ground source material, maintaining the reaction vessel filled to about 60 percent of its capacity with the iron grinding bodies, oscillating the reaction vessel to further grind the copper source material with the iron grinding bodies, to intimately admix the sulphuric acid leaching solution with the copper source material and the iron grinding bodies and to precipitate copper from the sulphuric acid leaching solution, transferring the leaching solution and leached solids from the reaction vessel to a settling tank, retaining the iron grinding bodies in the reaction vessel, settling the solids from the leaching solution in the settling tank, recirculating leaching solution from the settling tank back to the reaction vessel, depositing the settled solids from the settling tank in a flotation cell, and floating off the copper content of the solids as a foam to recover the copper as metallic copper cement.

4,242,130

HIGH-SPEED STEEL

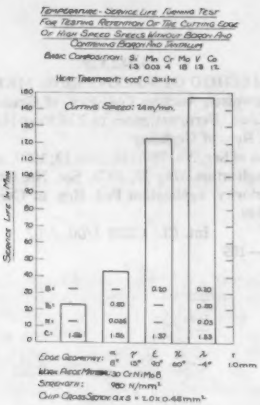
Helmut Brandis, Krefeld; Hans H. Weigand, Tönisvorst, and Wolfgang Spyra, Krefeld, all of Fed. Rep. of Germany, assignors to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,686

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758330

Int. Cl.³ C22C *38/22*

U.S. Cl. 75—126 C **2 Claims**


Temperature - Service Life Curve For Testing Retention Of The Cutting Edge Of High Speed Steels Without Boron And Containing Boron And Tantalum
Basic Composition: Si Mn Cr Mo V Co
1.3 0.03 4 10 1.9 1%
Heat Treatment: 600° C 3x1 hr.
Cutting Speed: 24 m/min.
Service Life in Min.
Edge Geometry: α 6° γ 10° ε 90° κ 60° λ -4° r 1.0mm
Work Piece Material: 30 CrNiMo 8
Specimen: 900 N/mm²
Chip Cross Section: a x s = 1.0 x 0.48 mm²

1. Highly wear-resistant, corrosion-resistant steel with high thermal resistance and tempering stability for cold and hot working tools as well as for parts subject to wear, consisting of:

0.7	to	1.7%	C
0.01	to	0.08%	N
0.02	to	1.5%	B
0.01	to	1.5%	Si
0.01	to	1.0%	Mn
5.0	to	15.0%	Co
3.0	to	7.0%	Cr
13.0	to	20.0%	Mo
0	to	10.0%	W
0	to	5.0%	V
0.02	to	2.0%	Nb and/or Ta
Remainder			Fe

4,242,131

COPPER BASE ALLOY CONTAINING MANGANE AND IRON

Eugene Shapiro, Hamden; John M. Vitek, Cheshire, and Warren F. Smith, Jr., Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1979, Ser. No. 74,513

Int. Cl.³ C22C *9/04*

U.S. Cl. 75—157.5 **8 Claims**

1. A copper base alloy having improved stress relaxation resistance consisting essentially of: about 15.0 to 31% zinc; about 1.0 to 5.0% aluminum; about 0.1 to less than 1.0% iron; about 1.1 to 8% manganese; and the balance essentially copper.

4,242,132

COPPER BASE ALLOY CONTAINING MANGANESE AND NICKLE

Eugene Shapiro, Hamden; John M. Vitek, Cheshire, and Warren F. Smith, Jr., Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1979, Ser. No. 74,520

Int. Cl.³ C22C *9/04*

U.S. Cl. 75—157.5 **8 Claims**

1. A copper base alloy having improved stress relaxation resistance consisting essentially of: about 15.0 to 31% zinc; about 1.0 to 5.0% aluminum; about 0.1 to less than 1.0% nickel; about 1.1 to 8% manganese; and the balance essentially copper.

4,242,133

COPPER BASE ALLOY CONTAINING MANGANESE

Eugene Shapiro, Hamden; John M. Vitek, Cheshire, and Warren F. Smith, Jr., Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1979, Ser. No. 74,536

Int. Cl.³ C22C *9/04*

U.S. Cl. 75—157.5 **10 Claims**

1. A copper base alloy having improved stress relaxation resistance consisting essentially of: about 15.0 to 31% zinc; about 2.5 to 4% aluminum; about 1.1 to 8% manganese and the balance essentially copper the copper content being less than 80% copper.

4,242,134

CADMIUM-FREE SILVER BASED BRAZING ALLOY

Thomas L. D'Silva, Beaverton, Oreg., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 25, 1979, Ser. No. 52,058

Int. Cl.³ C22C *5/00*

U.S. Cl. 75—173 C **3 Claims**

1. A quaternary brazing alloy consisting essentially in percent by weight of 5 to 15 germanium, 8 to 18 zinc, of 5 to 39 copper and the balance silver.

4,242,135

ELECTRICAL CONTACT MATERIALS OF INTERNALLY OXIDIZED AG-SN-BI ALLOY

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Japan

Filed Jul. 30, 1979, Ser. No. 61,846

Claims priority, application Japan, Aug. 11, 1978, 53-097363

Int. Cl.³ B32B *15/00*; C22C *5/10*

U.S. Cl. 75—173 A **2 Claims**

1. An electrical contact material made from a silver alloy comprising 3–15 weight % of Sn, 0.01–1.0 weight % of Bi, and 0.5–8.5 weight % of Cu, said silver alloy having been internally oxidized.

4,242,136

PROCESS FOR PRODUCING METALLIC ZIRCONIUM

Hiroshi Ishizuka, 19-2 Ebara 6-chrome, Shinagawa-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 808,165, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 547,170, Feb. 5, 1975, abandoned. This application Apr. 10, 1979, Ser. No. 28,841

Int. Cl.³ C22B *25/00*

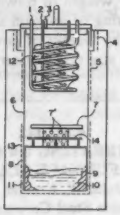
U.S. Cl. 75—84.5 **1 Claim**

1. A process for producing metallic zirconium by reacting zirconium tetrachloride vapor with molten magnesium contained in a reducing crucible which process comprises:

(1) Introducing zirconium tetrachloride vapor through a guide pipe means extending above and towards molten magnesium contained in a reducing crucible, said crucible being enclosed in a retort which is separately provided from a storage tank for the zirconium tetrachloride vapor,

said vapor being introduced onto the middle surface of the magnesium with a differential pressure of 0.1 to 0.2 kg/cm^2 between said retort and said storage tank, said reducing crucible being cooled from the outside in the course of the reaction thus caused between the zirconium tetrachloride with magnesium in the middle surface of the magnesium in a zone away from the crucible wall so as not to raise the temperature of said crucible wall and thereby eliminating the alloy formation of the zirconium product with the crucible wall material, to result in a preferred zirconium sponge layer deposit disposed at the bottom of said crucible, which contains the magnesium, with little adhesion of the sponge to the wall of the crucible, said sponge layer being covered by a layer of magnesium chloride by-product;

(2) freezing the by-product;



(3) cutting the crucible which contains zirconium sponge and the entire solid magnesium chloride by-product substantially horizontally and at a level such that substantially all of the zirconium sponge is separated from the by-product and thus contains only a small amount of said by-product;

(4) collecting a plurality of cut crucibles obtained by such reaction operations;

(5) placing said plurality of crucibles, which contain the zirconium sponge, together in a stack in a vacuum distilling device;

(6) heating said plurality of crucibles to remove any remaining by-product at a temperature high enough to evaporate said by-product; and

(7) recovering the purified zirconium sponge.

4,242,137

IMAGE TRANSFER COMPOSITION

Maurice A. Minuto, 15 Heminway Dr., Dix Hills, N.Y. 11746

Filed Aug. 30, 1979, Ser. No. 71,310

Int. Cl.^{3} C08L *1/26*; C09K *3/00*

U.S. Cl. 106—14.5 **12 Claims**

1. An image transfer composition suitable as image transfer medium for reproducing printed matter which has been imprinted on the surface of putty-like substances, said composition comprising from about 300 to about 400 parts by weight water; from about 1 to about 10 parts by weight of a thixotropic agent selected from the group consisting of hydroxyethyl cellulose and carboxymethyl cellulose; and from the about 80 to about 120 parts by weight of a water soluble glycol selected from the group consisting of ethylene glycol, propylene glycol and butylene glycol.

4,242,138

FLAMEPROOFED REGENERATED CELLULOSE AND METHOD

Claudine Mauric, Basel, and Rainer Wolf, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

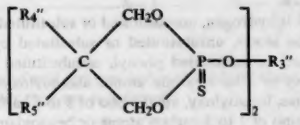
Continuation of Ser. No. 708,378, Jul. 26, 1976. This application Apr. 5, 1979, Ser. No. 27,488

Claims priority, application Switzerland, Jul. 31, 1975, 10003/75; Nov. 19, 1975, 14992/75

Int. Cl.^{3} C09K *3/28*; C09D *5/18*

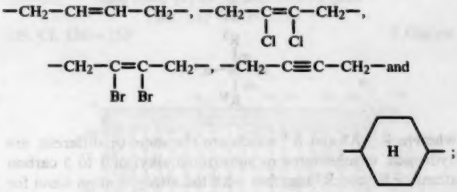
U.S. Cl. 106—18.18 **8 Claims**

1. Flameproofed regenerated cellulose containing, as a flameproofing agent, an effective amount of a compound of formula,



wherein

R_3'' is straight or branched chain C_3–C_5 alkylene; or a divalent radical selected from



with the proviso that when R_3'' is straight or branched chain C_3–C_5 alkylene, it is other than alkyl-substituted methylene; and

each of R_4'' and R_5'' is, independently, methyl; ethyl; —CH_2Cl; or —CH_2Br; with the provisos that: (a) when R_4'' is —CH_2Br, R_5'' is other than —CH_2Cl; and (b) when R_5'' is CH_2Br, R_4'' is other than —CH_2Cl.

4,242,139

WATER SOLUBLE BENZOXANTHENE DYESTUFFS FOR FLUORESCENT INKS

Helmut Tröster, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

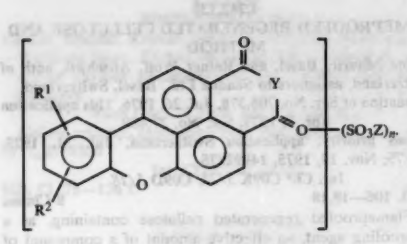
Filed Feb. 1, 1979, Ser. No. 8,484

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804530

Int. Cl.^{3} C09D *11/00*

U.S. Cl. 106—22 **30 Claims**

1. A fluorescent ink consisting of a liquid containing dissolved therein an effective amount of a dyestuff of the formula



I

wherein Y is oxygen or a group of the formula

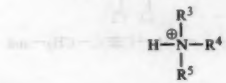
>N—R

in which R is hydrogen, unsubstituted or substituted alkyl of 1 to 5 carbon atoms, unsubstituted or substituted cyclohexyl, unsubstituted or substituted phenyl, unsubstituted or substituted alkoxy of 1 to 5 carbon atoms, alkanoyloxy of 1 to 5 carbon atoms, benzoyloxy, alkylamino of 2 to 5 carbon atoms, alkanoylamino of 1 to 5 carbon atoms or benzoylamino,

R^1 and R^2 which are the same or different, are hydrogen, halogen, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

n is a number of 1 to 3,

Z is an alkali metal or an ammonium cation of the formula



wherein R^3, R^4 and R^5 which are the same or different, are hydrogen, unsubstituted or substituted alkyl of 1 to 5 carbon atoms or R^4 and R^5 together with the nitrogen atom stand for piperidine, morpholine or piperazine.

4,242,140

ACTIVATION OF CLAYS BY COMPACTION

George R. Alther, Ferndale, Mich., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Nov. 28, 1979, Ser. No. 98,101
Int. Cl.³ C04B *33/13*
U.S. Cl. 106—72 **18 Claims**

1. A method of upgrading a crude smectite clay comprising first adding to said smectite clay 1–10% by weight of an activator substance in a soluble form containing a cation selected from the group consisting of Na, Li, K, Cs, NH_4, Zn, Ni, Cu, Co and Fe, said smectite clay having a maximum moisture content of about 20% by weight, thoroughly mixing said activator substance with said clay, and then compacting said clay into a compacted mass having an apparent density of from about 60–94% of the apparent density of the clay before it is ground, whereby the viscosity characteristics and the fluid loss characteristics of said treated clay are substantially improved over the crude clay.

4,242,141

RAPID-SETTING DRY PACKING MIX FOR ELIMINATING BORE HOLE TROUBLES AND METHOD OF MANUFACTURE THEREOF

Viktor F. Rogov, ulitsa Garibaldi, 30, korpus 2, kv. 70, Moscow; Nikolai K. Lipatov, ulitsa Mekhanizatorov, 1, kv. 4, Apatity Murmanskoi oblasti; Ruben A. Tatevosian, ulitsa Gorkogo 4, kv. 60; Mikhail Y. Titov, ulitsa Kominterna, 34/6, kv. 83, both of Moscow; Lev A. Tereschenko, ulitsa Gurdina, 5, kv. 34, Leningrad, and Arian M. Yakovlev, Grazhdansky prospekt, 15, kv. 210, Leningrad, all of U.S.S.R.

Filed Jul. 5, 1979, Ser. No. 55,061
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—89 **7 Claims**

1. A rapid-setting dry packing mix for eliminating bore hole troubles prepared on the basis of a powder gypsum-cement binder comprising:

from 40 to 50% by weight of powder cement;

from 50 to 60% by weight of powder binder selected from the group consisting of gypsum and alabaster; and

from 0.01 to 3.0% by weight of powder barium hexaferrite having a particle size commensurate with the particles of the binder.

4,242,142

METHOD FOR TREATING GRANULATED BLAST FURNACE SLAG

Kenneth H. Gee, and John W. Kreiger, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Del.

Continuation-in-part of Ser. No. 931,803, Aug. 7, 1977, abandoned. This application Jun. 27, 1979, Ser. No. 52,896
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—97 **19 Claims**

1. A method for preparing a water slurry of granulated blast furnace slag containing about 5 to 15 weight percent solids which have a particle size of 0.635 centimeter×0, for use in producing portland blast furnace slag cement and as a cementitious extender in producing concrete products comprising:

(a) screening the water slurry to separate and remove substantially all foreign matter from the water slurry,

(b) charging the water slurry into a classifier wherein the particles are separated into a coarse fraction and a fine fraction,

(c) partially dewatering the coarse fraction in a dewatering device and collecting the fine fraction in a tank,

(d) discharging the coarse fraction from the dewatering device to storage wherein a second portion of water is allowed to drain naturally from the coarse fraction,

(e) thermally drying the coarse fraction to remove substantially all the remaining moisture therefrom,

(f) mixing the coarse fraction with raw materials suitable for producing portland blast furnace slag cement,

(g) comminuting the mixture of step (f) to specified size, and

(h) adding the fine fraction as an extender to cementitious materials in the manufacture of concrete products.

4,242,143

PROCESS FOR IMPROVING THE PROPERTIES OF BITUMINOUS PRODUCTS AND AN IMPROVED CAST ASPHALT

Germain Hagenbach, Vernaison, and Paul Maldonado, St Symphorien D'Ozon, both of France, assignors to Elf Union, Paris, France

Filed Oct. 4, 1978, Ser. No. 948,545
Claims priority, application France, Oct. 5, 1977, 77 29953
Int. Cl.³ C08L *91/06, 95/00*
U.S. Cl. 106—272 **8 Claims**

1. In a cast asphalt composition comprising sand, gravel, fillers and bitumens in proportions such that the product can be cast while hot without compacting, the improvement which comprises using as said bitumen a mixture comprising a bitumen having a penetrability of from about 10 to 300 and a

soluble amount of from about 5 to 20% by weight based on the weight of the bitumen of a polyolefin wax.

4,242,144

BITUMINOUS MIXED COMPOSITION AND FILLER FOR SAME CONTAINING NON-HYGROSCOPIC CRYSTAL WATER-CONTAINING SUBSTANCES

Klaus Bergmann, Heiligenhaus; Friedrich Schmitz, Wülfrath; Gottfried Kilian, Mettmann, and Heinz Reppel, Wülfrath, all of Fed. Rep. of Germany, assignors to Rheinische Kalksteinwerke GmbH, Wülfrath, Fed. Rep. of Germany

Filed Apr. 9, 1979, Ser. No. 28,634

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1978, 2815285; Jul. 12, 1978, 2830612

Int. Cl.³ C08L *95/00*; C09D *3/24*

U.S. Cl. 106—281 R **12 Claims**

1. In a hot processed bituminous mixed composition particularly for use in road construction, the improvement comprising:

said composition containing as additives non-hygroscopic crystal water-containing substances capable of releasing their crystal water partly or completely at the mixing temperature.

4,242,145

PROCESS FOR THE SIMULTANEOUS PRODUCTION OF FRUCTOSE AND GLUCONIC ACID FROM GLUCOSE-FRUCTOSE MIXTURES

Hans-Rudolf Müller; Werner Kündig, both of Schaffhausen, and Alfred Hedinger, Thayngen, all of Switzerland, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,634

Claims priority, application Switzerland, Feb. 20, 1978, 1809/78

Int. Cl.³ C13K *3/00, 11/00*; C07C *59/105*

U.S. Cl. 127—46 R **7 Claims**

1. In a process for the simultaneous production of fructose, a salt thereof or a mixture thereof, and of gluconic acid, a salt thereof or a mixture thereof, from a glucose-fructose mixture, by selectively oxidizing the glucose, the improvement which comprises selectively oxidizing the glucose, at a pH of about 8–10, with oxygen, activated by a noble metal catalyst; and terminating the oxidizing step upon the formation of 1 equivalent, per mole of glucose employed, of the total amount of carboxylic acid and carboxylate ion produced during the oxidizing step.

4,242,146

METHOD FOR TREATING OIL-CONTAMINATED DRILL CUTTINGS

John Kelly, Jr., Arlington, Tex., assignor to Mobil Oil Corporation, New York City, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,564

Int. Cl.³ B08B *7/04*

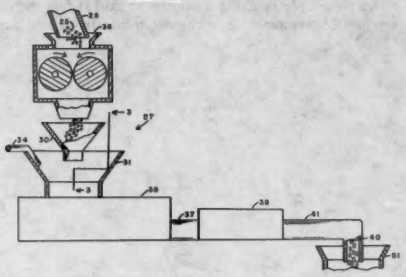
U.S. Cl. 134—7 **8 Claims**

1. A method of treating oil-contaminated drill cuttings from a well drilling operation in which a drilling fluid is circulated to remove drill cuttings from the well being drilled, said method comprising:

separating said cuttings from said drilling fluid;

mixing a solid, oil absorbent material with said separated cuttings to absorb free oil from the cuttings into said oil absorbent material;

compacting said cuttings and said oil absorbent material after mixing; and



disposing of said cuttings and said solid, oil absorbent material after they are compacted.

4,242,147

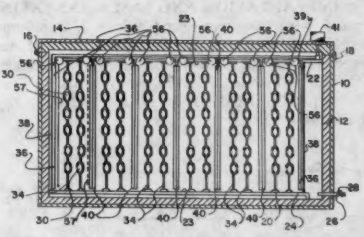
DEVICE FOR CONVERTING WASTE NUCLEAR ENERGY TO ELECTRICITY

Vincent D. DeToia, 3478 Kingsland Ave., Bronx, N.Y. 10469

Filed Nov. 15, 1978, Ser. No. 961,078

Int. Cl.³ G21H *1/12*

U.S. Cl. 136—253 **7 Claims**



1. A device for converting radiation of nuclear waste material to electricity, comprising a shielded casing; a frame in said casing; a plurality of hollow first containers, each housing a volume of radioactive waste materials in fluid or powder form, with said first containers mounted on said frame, said first containers further comprising closeable inlet means for replenishing said waste materials in said first containers,

light-emitting materials in at least one or more transparent second containers and at least partially surrounding each of said first containers and receiving radiation therefrom, thereby producing light; a plurality of photocells mounted on said frame in spaced relation thereto and receiving said light; current collecting means connected to said photocells for collecting electricity therefrom; and means for evacuating said casing, so as to provide a fluid-free interior space between said photocells and said light-emitting materials.

4,242,148

THERMOCOUPLE SURFACE PROBE

Patrick A. Remmert, Denville, N.J., assignor to Thermo Electric Co., Inc., Saddle Brook, N.J.

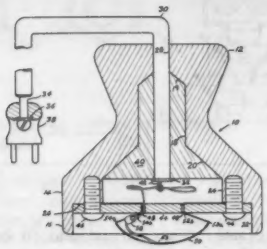
Filed Aug. 3, 1979, Ser. No. 63,384

Int. Cl.³ H01L *35/28*

U.S. Cl. 136—221 **10 Claims**

1. A thermocouple surface probe, comprising:

a body including a handle portion and a depending peripheral skirt defining a recessed bottom portion;
spring means mounted to said body in the recessed bottom portion;
a thermocouple junction mounted to said spring means;
a pair of thermocouple wires extending from said juntion; and



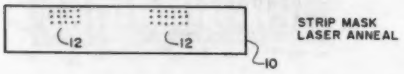
a connector connected to said thermocouple wires, whereby the peripheral skirt controls the compression of the spring means and blocks circulating air from reaching the junction when the probe is placed on a surface for measuring the temperature thereof.

4,242,149

METHOD OF MAKING PHOTODETECTORS USING ION IMPLANTATION AND LASER ANNEALING

Gerard J. King, Alexandria, and Aubrey J. Dunn, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1979, Ser. No. 62,593
Int. Cl.[3] H01L *21/26, 21/268;* B23K *26/00*
U.S. Cl. 148—1.5 **5 Claims**



1. A method of making at least one semiconductor photodetector including the steps of:
preparing a binary compound semiconductor substrate;
ion bombarding a side of said substrate in at least one predetermined area to implant ions to a predetermined depth; and
locally laser heating at least said predetermined area to said predetermined depth, whereby ion bombardment damage is healed, and whereby the implanted ions combine with at least one element of said compound to form a photodetector compound.

4,242,150

METHOD OF PRODUCING REINFORCING BARS WITH CORROSION RESISTANT COATING

Herris M. Maxwell, 2204 Riding Ridge Rd., Columbia, S.C. 29204

Filed May 25, 1979, Ser. No. 42,443
Int. Cl.[3] B21B *9/00*
U.S. Cl. 148—6.3 **9 Claims**

1. A method of applying a protective metal coating to a metal billet to produce a bar having corrosive resistant characteristics, such method comprising the steps of:
(a) plating the entire exterior surface of a ferrous billet with a layer of non-ferrous protective metal;
(b) covering the entire exterior surface of said plated ferrous billet with an adherent layer of a refractory material;
(c) heating said plated and covered ferrous billet in a normal atmosphere furnace to an elevated temperature at which said billet is malleable and at which significant oxidation of said non-ferrous protective metal would normally occur, said oxidation being substantially reduced by the presence of said layer of refractory material; and
(d) hot rolling said malleable ferrous billet to reduce the thickness thereof, whereby said ferrous bar is formed with a final coating including an exterior layer of said non-ferrous protective metal.

4,242,151

CHROMIZING OF STEELS BY GASEOUS METHOD

Robert Leveque, Firminy, France, assignor to Creusot-Loire, Paris, France

Filed Oct. 24, 1979, Ser. No. 87,954
Claims priority, application France, Oct. 25, 1978, 78 30308
Int. Cl.[3] C23C *11/04, 11/16*
U.S. Cl. 148—6.35 **3 Claims**

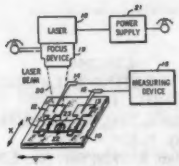
1. Improvement in the methods of chromizing steels, steels to a depth greater than 40 microns, usable for steels with a carbon content of at least 0.2%, comprising the combination of three successive treatments, the first of these three treatments consisting of an ionic nitriding of a surface layer between 100 and 350 microns thick, this ionic nitriding being carried out in an atmosphere constituted by a mixture of nitrogen and hydrogen, at a temperature of between 450° C. and 650° C., for between 5 and 40 hours, so as to obtain between 1.5% and 2.5% of nitrogen in the nitrided layer, the second of these three treatments consisting of a chormizing by gaseous method forming chromium carbides, lasting between 5 and 30 hours, and realized at temperatures of between 850° C. and 1,100° C., the third of these three treatments being a thermal treatment comprising an oil quenching of the chromized piece followed by a tempering at a temperature of between 600° C. and 650° C., lasting between 30 minutes and 10 hours, depending on the size of the piece to be treated.

4,242,152

METHOD FOR ADJUSTING THE FOCUS AND POWER OF A TRIMMING LASER

Richard H. Stone, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 14, 1979, Ser. No. 38,600
Int. Cl.[2] B23K *26/00*
U.S. Cl. 148—9.5 **12 Claims**



1. A process for trimming a deposited film on a substrate, using a laser to vaporize film material to produce a kerf therein, said process comprising the steps:
applying a laser beam to said film to vaporize a portion

thereof for controlling the characteristics of said film, whereby at least a portion of said vaporized material redeposits on the surface of said film in the vicinity of said kerf;

illuminating said redeposited material;

viewing said redeposited material at an angle so that said illumination produces light fringes; and

adjusting said laser to produce a predetermined light fringe configuration.

4,242,153

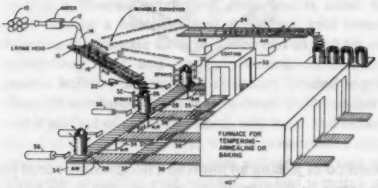
METHODS FOR HOT ROLLING AND TREATING ROD

Vito J. Vitelli, Shrewsbury; Asjed A. Jalil, Holden, and Norman A. Wilson, Shrewsbury, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Oct. 16, 1978, Ser. No. 951,379

Int. Cl.³ C21D *7/14*

U.S. Cl. 148—12 B **4 Claims**



1. A process comprising the steps of

(a) hot rolling low to medium carbon content steel rod in the conventional manner;

(b) as the rod exits from the final finishing stand of the mill with its austenite grains in the freshly recrystallized state and rapidly growing by merger of smaller grains under conditions of substantial excess heat above A_3, cooling the rod rapidly to about or slightly below A_3;

(c) terminating the rapid cooling close enough to A_3 to avoid any substantial transformation of the steel under rapid cooling conditions;

(d) coiling the rod into rings and depositing them onto a slowly moving conveyor so that the offset of the rings is between about 2 mm to 10 mm, and retarding the cooling thereof to obtain a maximum precipitation of free ferrite as well as a maximum development of coarse pearlite;

(e) continuing the retarded cooling until a major part of the rod is cooled to about 600° C. and transformation takes place to a substantial degree;

(f) gathering the rings and depositing them onto a mandrel mounted on a movable pallet while reducing the temperature of the remainder of the rod to around 600° C. to complete transformation;

(g) placing the rod (on the pallet) in an annealing furnace and bringing the rod temperature up to just below A_1 (usually around 667° C.); and

(h) holding the rod at the subcritical temperature until the structural grain size coarsens, and the carbides of the coarse pearlite therein start to form clusters.

4,242,154

PREHEAT AND CLEANING SYSTEM

James T. Pilling, Upland, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Continuation of Ser. No. 930,420, Aug. 2, 1978, abandoned, which is a division of Ser. No. 863,226, Dec. 22, 1977, abandoned. This application Oct. 3, 1979, Ser. No. 81,531

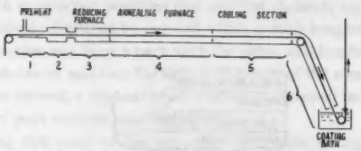
Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16.7 **5 Claims**

1. A process for continuously annealing metal strip comprising,

(a) introducing strip to be annealed into a single elongated tubular preheat zone and passing it therethrough as said strip contacts hot combustion gases flowing in a direction opposite to the direction of flow of said strip,

(b) passing said strip into a separate closed direct flame contact furnace wherein combustion gases are generated for direct flame contact on the surface of said strip within said furnace to thereby continue the preheating and cleaning thereof to effectively remove surface contaminants therefrom,

(c) thereafter subjecting said strip to a series of consecutive steps comprising:

(i) subjecting said strip to a reducing area within an atmosphere of hydrogen containing protective gases;

(ii) annealing said strip; and

(iii) cooling said strip;

(d) permitting said protective gases and said combustion gases to flow in a single direction countercurrent to the direction of travel of said strip through said furnace and then through said zone and exhausting said gases from the strip entry end of said preheat zone.

4,242,155

METHOD OF FORMING AN INSULATING FILM ON A GRAIN-ORIENTED SILICON STEEL SHEET

Nobuyuki Morito; Toshitomo Sugiyama; Yasuo Yokoyama, all of Kobe, and Toshio Ichida, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Apr. 23, 1979, Ser. No. 32,650

Claims priority, application Japan, Apr. 28, 1978, 53/51038

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—113 **1 Claim**

1. A method of forming a highly adhesive and uniform insulating film on a grain-oriented silicon steel sheet, without deteriorating the iron loss of the steel sheet, wherein a cold rolled silicon steel sheet having a final gauge is subjected to a decarburization annealing to form a silica-containing subscale on the surface, coated with an annealing separator consisting mainly of magnesia on the subscale and subjected to a final annealing to form an insulating film, an improvement comprising using a magnesia series annealing separator containing 0.1–10% by weight, calculated as strontium, of at least one strontium compound selected from the group consisting of $SrSO_4$, $Sr(OH)_2.8H_2O$, $SrCO_3$, and $Sr(NO_3)_2$, and 0.5–5% by weight, calculated as titanium, of a titanium compound.

4,242,156

METHOD OF FABRICATING AN SOS ISLAND EDGE PASSIVATION STRUCTURE

John L. Peel, Sandy, Utah, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1979, Ser. No. 85,148

Int. Cl.³ H01L *21/86, 21/20*

U.S. Cl. 148—175 **2 Claims**

1. A method of fabricating a silicon-on-sapphire semiconductor structure comprising the steps of:

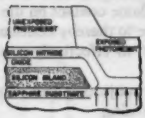
forming a silicon island on a sapphire substrate;

growing a first oxide layer over the major surface of said silicon island, including a top portion and a side portion;

depositing a nitride layer entirely over said oxide layer;

etching a portion of said nitride layer and said oxide layer

over part of said top portion of said silicon island spaced apart from the edge between said top portion and said side



portion to the bare silicon surface of said silicon island; and

growing a second oxide layer on said bare silicon surface.

4,242,157

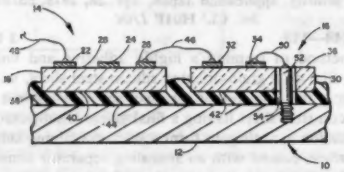
METHOD OF ASSEMBLY OF MICROWAVE INTEGRATED CIRCUITS HAVING A STRUCTURALLY CONTINUOUS GROUND PLANE

Richard W. Gehle, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 855,132, Nov. 28, 1977, Pat. No. 4,184,133. This application Apr. 20, 1979, Ser. No. 31,815

Int. Cl.³ G01R *31/26*

U.S. Cl. 156—64 **6 Claims**



1. A method of forming a microwave integrated circuit assembly, comprising:

(a) providing a substrate of dielectric material, said substrate having an upper surface and a lower surface;

(b) disposing components for microwave integrated circuitry on said upper surface of said substrate;

(c) providing carrier means for supporting said substrate;

(d) interposing a layer of a curable adhesive material between said substrate and said carrier wherein said layer of adhesive material is in contact with said lower surface of said substrate and the opposing surface of said carrier;

(e) maintaining said curable adhesive material in a tacky condition thereby permitting removal of said substrate from said carrier with moderate force;

(f) testing said microwave integrated circuitry for satisfactory operation;

(g) removing said substrate from said carrier when said testing step indicates unsatisfactory operation;

(h) replacing the removed substrate;

(i) repeating said testing step; and

(j) curing said adhesive material to hardness to attach said substrate to said carrier after said testing step indicates satisfactory operation.

4,242,158

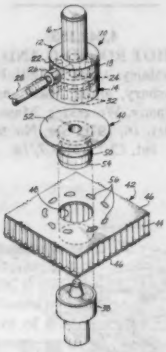
ADHESIVE DISPERSING ANVIL AND METHOD OF USING

Elvin G. Olson, Olympia, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 6, 1979, Ser. No. 73,174

Int. Cl.³ B21J *15/02, 15/10;* B32B *3/12, 7/08*

U.S. Cl. 156—92 **1 Claim**



1. A method of joining an insert to a honeycomb cored panel with the insert to be formed on one end, and to be adhesive bonded on the other end, the steps comprising: placing an adhesive on a surface of a honeycomb panel near a hole through the panel, introducing an insert into the hole with a large flat base for the insert contacting the adhesive, blowing compressed air through an anvil with the air coming out the working end of the anvil, and squeezing the insert between a forming die and the anvil for joining the insert to the panel while blowing adhesive off the surface of the insert contacted by the anvil.

4,242,159

PROCESS FOR THE PRODUCTION OF COMPOSITE MEMBRANES

Albrecht Klimmek; Wolfram Krieger, both of Frankfurt am Main, and Roland Reiner, Eschborn, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 14,952

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808222

Int. Cl.² B32B *31/12;* B01D *39/16*

U.S. Cl. 156—155 **13 Claims**

1. In a process for the production of a composite membrane consisting of a porous supporting membrane and a thin separating membrane, the improvement characterized by the steps of producing a separating membrane on the surface of a carrier film consisting essentially of at least one soluble polymer, placing the carrier film having the separating membrane thereon with its separating membrane side on a porous supporting membrane such that the separating membrane is between the supporting membrane and the carrier film, and then dissolving the carrier film.

4,242,160

METHOD OF WINDING A WIND TURBINE BLADE USING A FILAMENT REINFORCED MANDREL

Warren H. Pinter, East Hartland, and Dale E. Smith, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 2, 1979, Ser. No. 9,706
Int. Cl.[3] B65H *81/00*; F03D *1/06*
U.S. Cl. 156—175 6 Claims

1. A method of fabricating a large wind turbine blade spar on a winding mechanism comprising:

rotatably mounting a hollow one-piece cantilever removable mandrel on said winding mechanism, said mandrel comprising a filament-reinforced resin matrix inner tubular shell having a base end and a tip end, said inner shell tapering in diameter from said base end to said tip end and comprising first and second filament-reinforced resin matrix hollow, tapered half-cylinders bonded together; a filament-reinforced resin matrix outer shell bonded to the outer surface of said inner shell, said inner and outer shells forming a tapered mandrel wall of nonuniform thickness; and fitting means on said base end and on said tip end rotatably mounting said mandrel on said winding mechanism;

winding filaments on said mandrel to form said spar; and

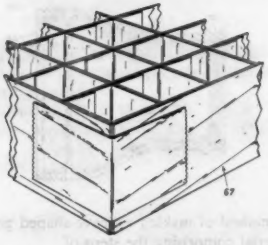
removing said mandrel from said winding mechanism and said spar.

4,242,161

METHOD AND A MACHINE FOR PRODUCING CELLULAR LATTICEWORK

Bengt H. Hulten, Hedemora; Hans T. Skarfelt, Habo, and Uno L. Gjertz, Astorp, all of Sweden, assignors to Munksjo Aktiebolag, Jonkoping, Sweden

Filed Feb. 27, 1978, Ser. No. 881,431
Claims priority, application Sweden, Feb. 28, 1977, 7702153
Int. Cl.[3] B31D *3/04*; A01G *9/10*; B32B *3/12*
U.S. Cl. 156—197 15 Claims



1. An improved method of producing a cellular latticework structure composed of cells of parallelepipedon shape the walls of which extend in parallel with the sides of the latticework and composed of e.g. paper, pasteboard, cardboard, corrugated cardboard or the like, which is coated with plastics on one side, the improvement comprising the steps of

applying on a web of e.g. paper treated as indicated above, four longitudinally extending, equidistantly spaced folding lines,

folding said folding lines while advancing said web, thus forming said web into a sleeve of square cross-sectional configuration with the marginal portions of said web overlapping,

bonding said marginal edge portions of said web together and thereafter flattening said sleeve, the latter being formed successively, and cutting said sleeve transversely into shorter pieces, called bits,

positioning a number of said bits in such a manner that one bit overlaps the adjacent one halfway as seen in the transverse direction, and bonding said bits together to form a flat element,

securing said flat elements thus formed to one another in such superposed positions that said flat elements are successively displaced by one cell width in their longitudinal direction and form a pack with flat sides, and bonding to each one of said two flat sides of the pack of flat elements thus formed, a thicker sheet covering the external faces of said pack entirely, and thereafter

cutting said pack of flat elements into pieces having the desired height of the cells, said pieces of desired height, after extension thereof, forming said cellular latticework structure.

7. A machine for producing a cellular latticework structure composed of cells having a parallelepipedon shape and the walls of which are positioned in parallel with the sides of said latticework structure, said cells composed of e.g. paper, pasteboard, cardboard, corrugated cardboard, or the like coated with plastics on one side, the improvement comprising

means to apply equidistantly spaced, lengthwise folding lines on a web of e.g. paper coated on one side with plastics,

folding means designed to fold said web while advancing the web successively, so as to form said web into a sleeve having a square cross-sectional configuration with the marginal portions of said web placed in overlapping position,

securing means designed to bond together said marginal portions of said web,

compressing means to flatten out said successively formed sleeve,

cutting means to cut said flattened sleeve transversely into shorter pieces, called bits,

a first glue-applicating means for application of glue on one face of each such bit,

conveying and gripping means designed to move said bits to a position wherein one bit overlaps the adjacent bit halfway as seen in the transverse direction, the said applied glue being positioned between said bits,

a second glue-applicating means for application of lengthwise strings of glue on one side of flat elements, said elements formed by interconnecting a number of bits,

means to stack said flat elements in such superposed positions that said flat elements are successively displaced over a distance corresponding to the width of one such cell in their longitudinal direction, a first sheet likewise provided with strings of glue extending along the entire pack of said elements thus formed, said flat elements being stacked onto said sheet in their superposed, successively displaced positions, and means to a advance and deposit a second similar sheet on the top of said pack of flat elements thus formed, and

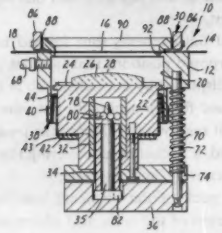
means to cut said pack of flat elements into pieces having the desired height of said cells, said pieces of desired height forming said cellular latticework structure after extension thereof.

4,242,162

TAPE APPLYING DEVICE AND METHOD

Albert J. Ronning, North Oaks; William H. Edwards, Vadnais Heights, and Dee L. Johnson, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 8, 1979, Ser. No. 37,240
Int. Cl.³ B29C *17/04, 17/00;* B32B *31/00*
U.S. Cl. 156—212 **8 Claims**



5. A method for applying pressure-sensitive adhesive coated tape smoothly over a first major surface of a lens blank, said method comprising the steps of

providing a tape support member having a tape support surface and having an opening generally centrally through the tape support member, and a lens blank support member within the central opening having a lens blank support surface adapted to support the lens blank with the first major surface of the lens blank adjacent the tape support surface;

positioning the lens blank on the lens blank support surface with the first major surface of the lens blank adjacent and spaced from the tape support surface;

positioning a portion of the tape on the tape support surface over the opening;

clamping the portion of the tape to the tape support surface; and

moving the support members relative to each other to move the support surfaces toward each other so that the first major surface of the lens blank will contact the clamped tape portion and cause the tape to be smoothly applied to the first major surface of the lens blank, said moving step including the steps of:

lowering the air pressure in the opening between the lens blank support member and the clamped tape portion so that atmospheric air pressure acting on the lens blank support member and the tape portion will provide a force to cause the relative movement which force decreases as the tape is applied; and

biasing the support surfaces away from each other with a force that together with the force applied by tension in the portion of the tape about equals the force exerted by the atmospheric air pressure when the tape is fully applied to stop relative movement of the support surfaces.

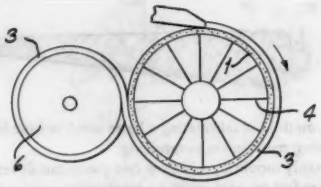
4,242,163

PROCESS FOR MANUFACTURING MAGNESIUM CARBONATE BOARD

Shiro Nakajima, and Toshiro Miyata, both of Aichi, Japan, assignors to Nippon Hardboard Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 811,280, Jun. 29, 1977, abandoned.
This application Nov. 22, 1978, Ser. No. 962,918
Claims priority, application Japan, Jun. 30, 1976, 51/078024
Int. Cl.³ B29J *5/04*
U.S. Cl. 156—242 **1 Claim**

1. A method of fabricating magnesium carbonate board or plate-like body which comprises forming an aqueous suspension comprising neutral magnesium carbonate admixed with fibrous material and active magnesia, casting the resulting formed aqueous suspension onto a porous permeable carrier to form a layer of solids thereon comprising said neutral magnesium carbonate, fibrous material and active magnesia, the amount of aqueous suspension cast onto said carrier being such as to deposit on said carrier an amount of solids comprising said neutral magnesium carbonate, active magnesia and fibrous material up to about 1500 grams of solids per square meter of said carrier onto which said suspension has been cast, the water



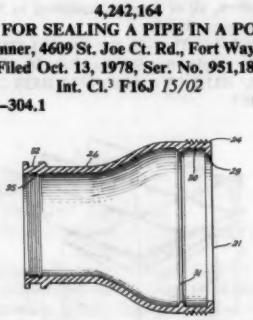
content of said layer being controlled to a value in the range 30–50% by weight of said layer, laminating or building up a number of said layers comprising magnesium carbonate, active magnesia and fibrous material and pressing and heat curing the resulting laminated layers at a temperature less than about 100° C. and in an atmosphere having a relative humidity greater than 80% to form said magnesium carbonate board of plate-like body having a relatively high specific gravity in the range 0.78–1.15.

4,242,164

GASKET FOR SEALING A PIPE IN A PORTHOLE

Harry W. Skinner, 4609 St. Joe Ct. Rd., Fort Wayne, Ind. 46815

Filed Oct. 13, 1978, Ser. No. 951,189
Int. Cl.³ F16J *15/02*
U.S. Cl. 156—304.1 **4 Claims**



1. The method of making a sleeve-shaped gasket of elastomeric material comprising the steps of

(a) forming a gasket of elastomeric material to a shape having a sleeve-like body with a reflexly turned flange on the end thereof which encircles at least a portion of said body with a first annular coaxial rib on the inner surface of said flange adjacent the end thereof, and with a second annular coaxial rib on the inner surface of said body adjacent the end opposite said flange, and

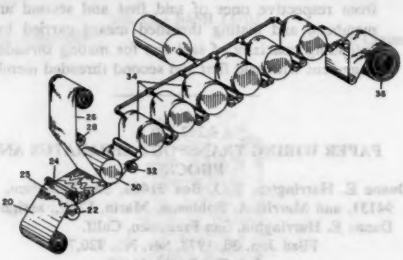
(b) turning said gasket inside out thereby to relocate said flange as a tubular coaxial extension of said sleeve-like body and further to position said first rib on the inside of said flange and the second rib on the outside of said body of the extended body and flange.

4,242,165

INSULATING MATERIAL AND PROCESS FOR MANUFACTURING SAME

Julius Shaw, 259 Field St., New Bedford, Mass. 02740

Filed Apr. 23, 1979, Ser. No. 32,286
Int. Cl.³ C09J 7/00
U.S. Cl. 156—313 **2 Claims**



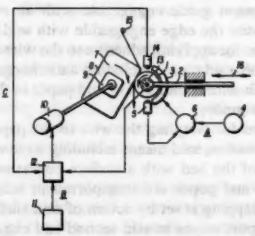
1. A process for producing an insulating laminate for use in electrical apparatuses able to withstand temperatures of up to 600° F. that does not use asbestos comprising the steps of:
providing a rolled web of aluminum foil having a thickness of between 0.0007 in. and 0.001 in.;
passing said web over a resilient roller;
providing a knife above said resilient roller disposed approximately 3.5 mils above said foil web;
providing a volume of latex acrylic adhesive upon said web in front on said knife adapted so that a portion of said adhesive can pass under said knife to said foil web;
passing said foil web under a marriage roller and above an idler roller;
providing a non-woven glass fiber paper-like web having a thickness of between 0.015 in. and 0.070 in. above said foil web;
passing said glass fiber paper-like web under an expander roller above said foil web, then under said marriage roller and over said idler roller so that said adhesive is forced from said foil web into the interstices of the glass fiber paper-like web sheet;
passing said laminate over at least six cans heated in the range of 225° F. to 240° F.; and thereby
curing said adhesive to provide a permanent bond between said foil web and said glass fiber paper-like web.

4,242,166

THERMAL STAMPING APPARATUS

Hiroshi Izumihara, Gose, Japan, assignor to Taihei Industries Co., Ltd., Osaka, Japan

Filed Nov. 23, 1979, Ser. No. 96,878
Claims priority, application Japan, Dec. 18, 1978, 53-156715
Int. Cl.³ G05G 15/00
U.S. Cl. 156—351 **3 Claims**



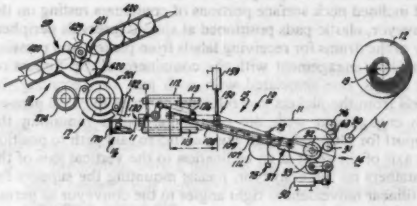
1. A thermal stamping device for transferring a film from its carrier to the surface of an object to which said film is to be adhered, said device comprising:
a heat transfer roll for pressing said film and its carrier toward said surface as said transfer roll rolls over said surface;
a heater for heating said transfer roll;
a temperature control means for controlling said heater;
drive means for rotatably supporting said object adjacent said transfer roll, said drive means including speed control means for controlling the stamping speed at which said transfer roll traverses said surface; and,
speed modifying means for controlling said speed control means to vary said stamping speed in accordance with variations in the surface temperature of said transfer roll.

4,242,167

LABELING MACHINE

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Oct. 26, 1978, Ser. No. 954,865
Int. Cl.³ B65C 9/04
U.S. Cl. 156—357 **22 Claims**



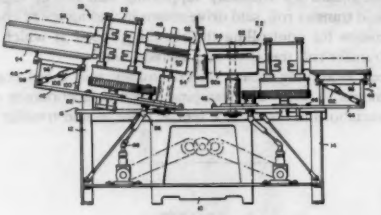
1. Apparatus for severing segments of sheet or film like material from a continuous length of the same and for applying such severed segments to articles, said apparatus comprising:
(a) a pre-feed including a continuously operating drive roller and a pinch roller, said rollers being parallel and one of them being mounted for movement into and out of engagement with the other roller for pulling such material from a roll of the same when they are in engagement and for terminating such pulling when they are disengaged
(b) storage means for storing in loose condition a quantity of such material as delivered by said pre-feed
(c) a reciprocating feed having a feed stroke and a return stroke and operable during each feed stroke to grip, withdraw from such storage means and feed forwardly a predetermined length of such material
(d) a severing means operable to sever segments of material of predetermined length as fed to it by said reciprocating feed during each forward stroke thereof
(e) transfer means operable to pick up each severed segment and transfer it to an application station
(f) an article feed operable to supply articles in succession to said application station, said article feed and transfer means being operable to apply a segment to each such article and
(g) control means acting to engage and disengage said rollers, said control means including a scanner which senses when the quantity of material in storage reaches a predetermined length, said control means including in addition to the scanner mechanical means actuated by the scanner to disengage the rollers when such condition is sensed and to re-engage the rollers thereafter when the length of stored material has diminished.

4,242,168

LABELING MACHINE

Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Apr. 27, 1979, Ser. No. 33,880
Int. Cl.³ B65C 3/14
U.S. Cl. 156—357 **6 Claims**



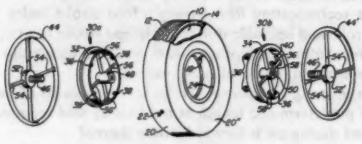
1. In a labeling machine wherein a conveyor moves containers of the kind having vertical and inclined surfaces in upright positions along a predetermined path, a support adjacent said path, a shaft mounted on the support with its axis perpendicular thereto for rotation about its axis, transfer drums fixed to the shaft for rotation therewith and located thereon in positions such that their peripheral surfaces confront the vertical and inclined neck surface portions of containers resting on the conveyor, elastic pads positioned at spaced intervals peripherally of the drums for receiving labels from pickers and pressing them into engagement with the containers, clamp fingers on the drums, one associated with each pad, for receiving the labels from the pickers and releasing them as they are pressed into engagement with the containers, means mounting the support for tilting about an axis parallel to said path to position the axis of the shaft at an inclination to the vertical axis of the containers on the conveyor, means mounting the support for rectilinear movement at right angles to the conveyor to permit adjustment of the proximity of the pads to the path of movement for containers of different diameter and means for maintaining a driving connection with the shaft regardless of the position of the support.

4,242,169

TIRE RETREADING APPARATUS

William M. DeHaven, Asheboro, N.C., assignor to Harrelson Rubber Company, Asheboro, N.C.

Filed Oct. 11, 1979, Ser. No. 83,746
Int. Cl.³ B29H 17/36
U.S. Cl. 156—394 **11 Claims**



1. In a tire retreading apparatus for use in forming an assembly including a tire-mounting rim; a tire mounted upon said rim; a replacement tread strip upon said tire; a flexible envelope having a central portion overlying said tread strip, and first and second marginal edge portions respectively overlying and adapted to be maintained in sealed engagement with respective first and second opposite sidewalls of said tire; and first and second annular envelope-sealing members adapted to be releasably secured in axially aligned relationship with same rim and in closely overlying relationship to respective ones of said first and second marginal edge portions of said envelope; the improvement comprising:

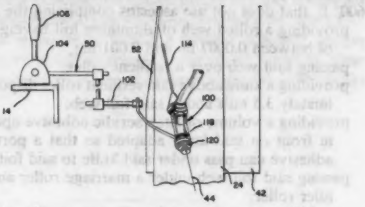
first and second releasable connecting means independently connecting respective ones of said first and second annular members to and in axial alignment with said rim for independent axial movement of each of said members, in response to rotation thereof about its central axis, toward and away from respective first and second ones of said marginal edge portions of said envelope; said first and second connecting means including first and second shaft-like threaded members carried by and projecting axially from respective ones of said first and second annular members, and mating threaded means carried by and extending coaxially of said rim for mating threaded engagement with said first and second threaded members.

4,242,170

PAPER WIRING TRANSPORT APPARATUS AND PROCESS

Duane E. Harrington, P.O. Box 31480, San Francisco, Calif. 94131, and Merritt A. Robinson, Marin, Calif., assignors to Duane E. Harrington, San Francisco, Calif.

Filed Jun. 30, 1978, Ser. No. 920,711
Int. Cl.³ B65H 45/00
U.S. Cl. 156—438 **11 Claims**



1. Apparatus for improved continuous attachment of a wire to a paper comprising:

a. an elongated support structure, having a first end and a second end;

b. means for rotatably supporting a supply of paper at said first end of said support structure;

c. means for rotatably supporting a supply of wire at said first end of said support structure;

d. a fabrication station located generally between said first end and said second end of said support structure, said station including a substantially flat bed across which the paper is transported, said bed having means for overlapping one edge of the paper over the wire, said means comprising a wave guide mounted on said bed and engageable with one edge of the paper;

e. guide means for guiding wire from the wire supply to said fabrication station;

f. guide means for guiding paper from the paper supply to said fabrication station, said guide means including a paper alignment guide located at said fabrication station, said alignment guide engageable with an edge of the paper opposite the edge engageable with said wave guide;

g. means for applying adhesive to the wire at said fabrication station, said means including a discharge element through which wire is directed at said paper in the location of said wave guide;

h. means for coupling the wire to the paper at said fabrication station, said means including a curved member at the end of the bed with a surface curvature over which the wire and paper are transported in tension, wherein the overlapping is set by action of said surface curvature;

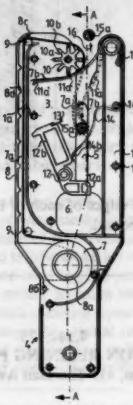
i. transport means at said second end engaging the coupled wire and paper for transporting the wire and paper across the fabrication station.

4,242,171

SEALING DEVICE FOR SECURING OR SEALING BAGS OR SACKS OF FLEXIBLE MATERIAL

Johann Kauer, Bern, Switzerland, and Heinz H. Weick, 94, Rue de la Servette, 1202 Geneva, Switzerland, assignors to Heinz Hermann Weick, Geneve, Switzerland

Filed Aug. 9, 1978, Ser. No. 932,368
Claims priority, application Switzerland, Aug. 19, 1977, 10237/77
Int. Cl.³ B65B 13/02
U.S. Cl. 156—485 16 Claims



1. A device for securing with an adhesive tape a twisted neck portion of a bag or sack of flexible material, the device comprising:

(a) an elongated housing,

(b) a mounting carried by the housing and being arranged for supporting a roll of adhesive tape,

(c) walls forming part of the housing and defining a slit having an open end and a closed end and which extends generally longitudinally of the housing, the walls also defining an exit opening at the inner end of the slit, the exit opening being located to permit removal of the neck portion after application of the tape thereto,

(d) a tape guide member carried by the housing on one side of the slit,

(e) a tape severing means carried by the housing for movement relative thereto and located in the region of the inner end of the slit,

(f) a tape cutter provided by the tape severing means,

(g) a spring biassing means carried by the housing and engaging the tape severing means, and mounted to spring bias the tape cutter away from the slit except when an actuating arm of the tape severing means is engaged by the neck portion,

(h) a spring loaded arm carried by the housing and located on the opposite side of the slit to the tape guide member, the said arm in a normal position thereof extending across the slit and being adjacent to the tape guide member, the said arm being located to maintain an adhesive contact with a free end portion of a tape passing round the tape guide member, and

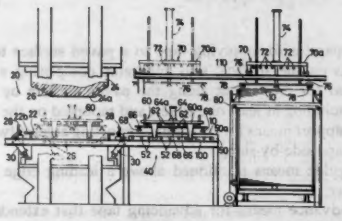
(i) the housing having an elongated U-shaped portion defining the slit and an elongated extension portion below the exit opening of the slit, said extension portion extending substantially in the longitudinal direction of the slit and forming a handle for the device.

4,242,172

METHOD OF PRESS-FORMING CORRUGATED PAPERBOARD INTO CURVED BOARD AND APPARATUS FOR SAME

Toshihiko Fujii, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 12, 1978, Ser. No. 941,741
Int. Cl.³ B32B 31/00
U.S. Cl. 156—499 4 Claims



1. An apparatus for press-forming a planer board of corrugated paperboard into an at least partly curved board, the corrugated paperboard being of the type utilizing a thermoplastic resin as the adhesive to bond paper liners to a corrugated paper medium, the apparatus comprising:

a hot-press fitted with a heatable and stationary female die and a heatable and vertically movable male die above said stationary female die;

a table standing beside said hot-press, the top of said table being wide enough to support thereon said planer board substantially horizontally;

a pair of rails extending horizontally alongside said hot-press and said table;

a wheeled carrier which can move on said rails in either direction and has board-holding means for taking up said planer board from the top of said table, holding said planer board during movement of said carrier on said rails and laying said planer board on said stationary female die;

at least one electric heater attached to said carrier in such an arrangement that said planer board held by said carrier is spaced downwards from said electric heater and can be preheated by said electric heater to such an extent that said thermoplastic resin in said planer board softens before said planer board is placed on said stationary female die;

another pair of rails extending horizontally at an altitude greater than the height of said table from a space above said table in a direction opposite to said hot-press;

a rack which supports a stack of said planer boards and is located beneath said another pair of rails and at a distance from said table;

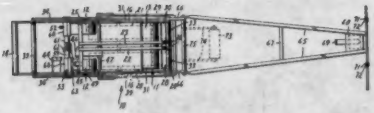
another wheeled carrier which can move on said another pair of rails in either direction and has board-holding means for taking up said planer board from said rack, holding said planer board while said another carrier moves on said another pair of rails and laying said planer board on said table;

and at least one electric heater attached to said another carrier in such an arrangement that said planer board held by said another carrier is spaced downwards from said heater of said another carrier and can be heated by said heater of said another carrier.

4,242,173
PAVEMENT-MARKING TAPE APPLICATION APPARATUS

Heinrich F. Stenemann, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Sep. 27, 1979, Ser. No. 79,241
Int. Cl.[3] E04B 2/00; E04F 13/00; B44C 7/00, 7/04
U.S. Cl. 156—523 8 Claims



7. Apparatus for applying tape to a paved surface to form markings on the surface, said apparatus comprising a frame supported for movement along the paved surface by wheel means including at least one roller, and mounted on the frame:

tape support means for rotatably supporting at least two rolls of tape side-by-side;

tape guide means positioned above a leading edge of the roller;

tape advance means for advancing tape that extends from the rolls of tape over the tape guide means into position for the roller to press the tape against the paved surface; and

cutting means for cutting the tape while it extends under tension from the tape guide means to the roller, the cutting means comprising two arms mounted one on each of the two sides of the frame, a knife blade extending between the forward ends of the arms and across the lengths of tape that extend from the tape guide means to the roller; and actuating means for pulling one of the arms ahead of the other, whereby the knife blade may be tilted toward one of the lengths of tape prior to movement through the lengths of tape so as to cut one length prior to cutting the other length.

4,242,174
SHEET BINDING SYSTEM

Donald L. Snellman, 2807 W. Galer, Seattle, Wash. 98199; Barry J. Lewis, 31511 41st Ave. S.W., Federal Way, Wash. 98003; Arthur G. Saunders, 19827 Maple Valley Hwy., Maple Valley, Wash. 98038, and Wesley W. Hester, 1007 144th Pl. S.E., Bellevue, Wash. 98007

Filed Nov. 17, 1978, Ser. No. 961,565
Int. Cl.[3] B32B 31/00; B65H 37/00; B05C 1/00
U.S. Cl. 156—563 9 Claims

1. Adhesive binding apparatus for edge binding multiple sets of sheet material held in a stack of multiple trays comprising:

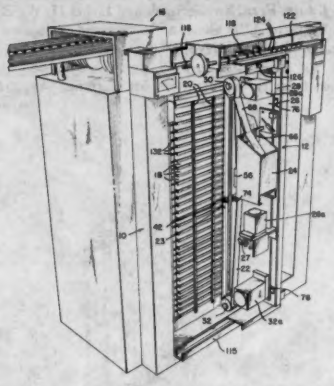
adhesive application means including a movable adhesive transfer belt having a frontside facing the multiple trays and aligned edges of the multiple sets of sheet material to be bound and a backside, the transfer belt movable between a retracted position out of contact with the edges of the multiple sets of sheet material and an adhesive application position for transfer of adhesive on the belt onto the edges of the sets of the sheet material,

an adhesive dispenser for depositing adhesive on the transfer belt,

means mounting the belt for transfer between the retracted and the adhesive application positions,

a belt aligning bar, and

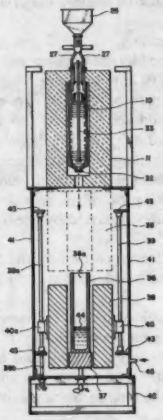
means connected to the belt aligning bar which, when the belt is moved from the retracted position to the adhesive application position, contact the front surface of the trays holding the sets of sheet material to align the belt aligning bar and the frontside run of the belt so that they are parallel to the front surface of the trays and to a plane extending through the edges of each of the multiple sets of sheet material to be bound.



4,242,175
SILICON REFINING PROCESS

Allen D. Zumbrunnen, 419 Sherman Ave., Salt Lake City, Utah 84115

Filed Dec. 26, 1978, Ser. No. 973,134
Int. Cl.[3] C30B 11/02
U.S. Cl. 156—616 R 8 Claims



1. A silicon refining process, comprising continuously flowing molten, impure silicon downwardly through a reaction chamber as a thin film; contacting said film with an impurity-reactive gas or gases as the molten metal flows through the reaction chamber; discharging the thus treated molten metal from the bottom of the reaction chamber directly into a columnar crucible; subjecting the molten metal in the crucible to directional solidification; extracting the resulting solid silion billet from the crucible; and separating relatively pure and relatively impure portions of said silicon billet one from another.

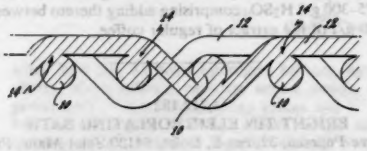
4,242,176
METHOD OF FOAMING PERFORATE SHEET MATERIAL FROM WIRE MESH

Frank J. Riel, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation of Ser. No. 908,810, May 24, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,254

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/00*

U.S. Cl. 156—630 **4 Claims**



1. Method of manufacture of porous material for utilizing as a face sheet attenuation structure comprising:

selecting a sheet of stainless steel wire mesh material with overlapping perpendicular fibers defining the openings therethrough;

degreasing said sheet of wire mesh material;

suspending said sheet of wire mesh material within an oven;

elevating the temperature of said oven and maintaining said oven at said elevated temperature for a sufficient length of time to diffusion bond overlapping portions of said fibers;

allowing said oven to return to room temperature;

removing said wire mesh material from said oven; and

chem-milling said wire mesh material to increase the cross-sectional size of said openings by reduction of the cross-sectional size of said perpendicular fibers.

4,242,177
METHOD FOR OXIDIZING MALODOROUS SULFUR COMPOUNDS IN KRAFT COOKING LIQUOR

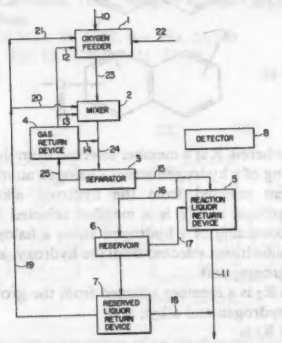
Masayuki Suzuki; Nobuo Onuma; Fumihiko Ishizuka; Shinichi Hara, all of Hachinohe; Akira Osawa, Ichikawa, and Akira Fukuzawa, Yokohama, all of Japan, assignors to Mitsubishi Paper Mills, Ltd. and Mitsubishi Heavy Industries, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 774,952, Mar. 7, 1977, abandoned. This application Aug. 9, 1978, Ser. No. 932,198

Claims priority, application Japan, Apr. 7, 1976, 51-38917

Int. Cl.[3] **D21C** *3/02, 11/04, 11/08*

U.S. Cl. 162—17 **14 Claims**



1. A method for removing malodorous substances formed in kraft pulp cooking process by oxidizing at a high temperature and high pressure the cooking liquor in the end stage of cooking, which method is characterized by introducing oxygen or an oxygen-containing gas into said liquor at one or more points of a liquor circulating system of a digester to allow the oxygen to react with the liquor, separating the unreacted oxygen or the unreacted oxygen-containing gas from the reaction liquor and recycling it to the reaction zone, while returning the oxygen-separated reaction liquor to said circulating system or directly to the digester, or temporarily storing a part or whole of the oxygen-separated reaction liquor in a reservoir and thereafter returning it to the circulating system, or to the digester wherein the oxygen introduction rate is controlled proportionally to the remaining sodium sulfide concentration of the cooking liquor and the oxidation reaction time is limited to avoid excessive oxidation of organic substances dissolved in the cooking liquor and to minimize the pH decrease of the cooking liquor.

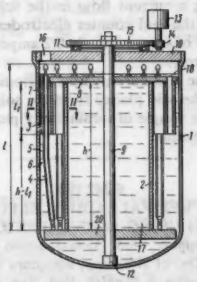
4,242,178
DRUM FOR STORAGE OF NUCLEAR REACTOR FUEL ASSEMBLIES

Vladimir I. Batjukov, ulitsa Prygunova, 9, kv. 29; Alexandr F. Shapkin, ulitsa Zvezdinka, 3, kv. 64; Alexandr I. Fadeev, ulitsa Engelsa, 21, kv. 46; Tsolak G. Shkhian, naberezhnaya Zhdanova, 6, kv. 16, and Vitold A. Sumatokhin, ulitsa Strazh Revoljutsii, 28, kv. 21, all of Gorky, U.S.S.R.

Filed Jan. 6, 1978, Ser. No. 867,536

Int. Cl.[2] **G21C** *19/20;* **G21F** *5/00*

U.S. Cl. 176—30 **4 Claims**



1. A drum for storage of elongated, spent, nuclear reactor fuel assemblies having portions bent along their length a total lateral distance Z, comprising:

a housing;

a cylinder positioned vertically in said housing and having a top end face and a bottom end face;

holder means for holding said fuel assemblies in a position substantially along the vertical direction of said cylinder, said holder means connected with said cylinder;

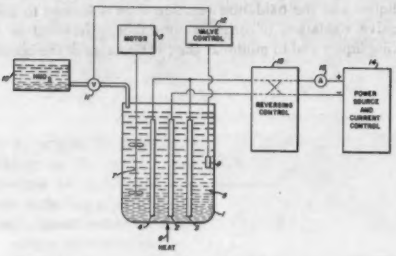
wherein said holder means comprises a plurality of walls defining enclosures extending substantially along the vertical direction of said cylinder for accommodating said fuel assemblies, said enclosures each having an inner diameter greater than the outer diameter of a fuel assembly and less than the sum of the outer diameter of said fuel assembly and the distance Z and said enclosures further each having a longitudinal portion which is at least partly open for accommodating the bent portion of one of said assemblies.

4,242,179

METHOD OF FABRICATING CADMIUM ELECTRODES

David H. Fritts, Dayton; John F. Leonard, Xenia, and Thirumalai G. Palanisamy, Fairborn, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 27, 1979, Ser. No. 61,558
Int. Cl.[3] C25D 9/08; C25B 1/16
U.S. Cl. 204—2.1 5 Claims



1. An improved method for impregnating a sintered porous nickel plaque having a porosity of about 70 to 90% to form a cadmium battery electrode which comprises the steps:

a. positioning the said plaque in a $Cd(NO_3)_2$ solution in spaced apart relationship between cadmium counter electrodes;
b. heating the said solution to a temperature between 80° C. and 100° C.;
c. maintaining the said solution at a pH of 2.5 to 4.5 by the periodic addition of HNO_3;
d. diffusing the HNO_3 throughout the solution, and minimizing temperature gradients throughout the solution by continuous mixing of the solution;
e. maintaining a current flow in the solution between the plaque and the said counter electrodes to provide a current density of approximately 0.2 amperes per square inch of plaque area;
f. reversing the said current flow periodically;
g. removing the said plaque from the solution;
h. washing the plaque in substantially pure water; and
i. drying the plaque.

4,242,180

AMMONIA FREE PALLADIUM ELECTROPLATING BATH USING AMINOACETIC ACID

Klaus-Dieter Heppner, and Hans-Joachim Schuster, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 863,044, Dec. 21, 1977, Pat. No. 4,144,141. This application Jan. 12, 1979, Ser. No. 2,965
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657925
Int. Cl.[3] C25D 3/52
U.S. Cl. 204—43 N 6 Claims

1. An aqueous ammonia-free bath for galvanic deposition of metal selected from the group consisting of palladium and palladium alloys wherein said palladium is present in the form of a diglycinate palladium II complex in which aminoacetic acid is the complexing agent said bath being further characterized by containing

(A) from about 1 to 50 grams per liter of dissolved palladium,
(B) from and including 0 to 50 grams per liter of at least one other metal selected from the group consisting of silver, nickel and cobalt,
(C) from about 1 to 150 grams per liter of total added aminoacetic acid, and
(D) sufficient dissolved alkali metal hydroxide to produce a bath pH ranging from about 7 to 12.

4,242,181

COPPER PLATING PROCESS FOR PRINTED CIRCUIT BOARDS

Thomas P. Malak, Garfield Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed Nov. 9, 1979, Ser. No. 93,081
Int. Cl.[3] C25D 3/38
U.S. Cl. 204—52 R 4 Claims

4. The method of improving the grain refinement of an electroplating bath composed of 70–150 g/l of $CuSO_4.5H_2O$ and 175–300 g/l H_2SO_4 comprising adding thereto between 0.1 and 1.0 g/l of the extract of regular coffee.

4,242,182

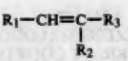
BRIGHT TIN ELECTROPLATING BATH

Francine Popescu, 32, rue E. Dolet, 94100 Saint Maur, France

Filed Jul. 21, 1978, Ser. No. 926,891
Int. Cl.[3] C25D 3/30
U.S. Cl. 204—54 R 13 Claims

1. An acidic aqueous tin electroplating bath comprising:

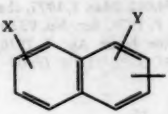
(a) stannous tin ions;
(b) at least one acid selected from the group consisting of sulfuric acid and fluoboric acid;
(c) about 1.0 to 20.0 grams per liter of a dispersing agent;
(d) about 0.1 to 5.0 grams per liter of a member selected from the group consisting of: aliphatic nonsaturated acids having 3 to 6 carbon atoms in the molecule, aliphatic esters of said nonsaturated acids, and amides of said nonsaturated acids; and
(e) about 0.2 to 0.7 grams per liter of a brightener dispersed in the said bath and defined by the general formula:



I.

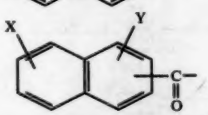
wherein:

(A) R_1 is a member selected from the group consisting of:



II.

and

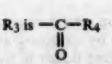


III.

wherein X is a member selected from the group consisting of a hydrogen atom; a halogen atom; and a substituent selected from the hydroxy, alkoxy, and alkyl groups; and Y is a member selected from the group consisting of a hydrogen atom; a halogen atom; and a substituent selected from the hydroxy, alkoxy, and alkyl groups; and

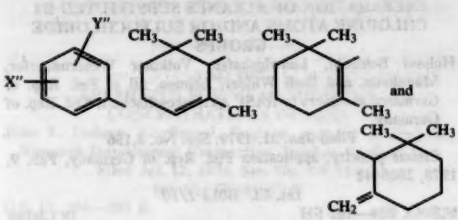
(B) R_2 is a member selected from the group consisting of hydrogen and alkyl; and

(C) R_3 is



(C)

when R_1 is II., and R_3 is a member selected from the group consisting of:



when R_1 is III., X" being hydrogen, halogen, hydroxy, alkoxy, alkyl, sulfoxy, carboxy, amino, amido, or together with Y" a methylenedioxy group, and Y" being hydrogen, halogen, hydroxy, alkoxy, alkyl, sulfoxy, carboxy, amino, amido, or together with X" a methylenedioxy group;

(D) R_4 is a member selected from the group consisting of alkyl, phenyl, hydroxyphenyl, alkoxyphenyl, dialkoxyphenyl, alkylphenyl, pyridyl, alkylpyridyl, and hydroxypyridyl.

4,242,183

HIGHLY ACTIVE SILVER CATHODE, PREPARATION OF SAME AND USE TO MAKE 2,3,5-TRICHLOROPYRIDINE

Demetrios Kyriacou, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 13, 1979, Ser. No. 29,600
Int. Cl.³ C25B *3/04, 11/04;* C25D *3/46;* C07D *211/72*
U.S. Cl. 204—73 R **13 Claims**

1. An electrode comprising a shaped electrical conductor in intimate contact with a water and hydroxyl ion-containing immobilized, metastable layer of aggregated silver microcrystals formed by electrolytic reduction of colloidal, hydrous silver oxide particles in the presence of water and hydroxyl ions.

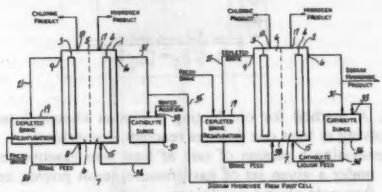
13. The process for preparing 2,3,5-trichloropyridine which comprises electrolytically reducing 2,3,5,6-tetrachloropyridine at an electrode as defined in claim 1, said catholyte including an organic solvent for said tetrachloropyridine.

4,242,184

MEMBRANE CELL CHLOR-ALKALI PROCESS HAVING IMPROVED OVERALL EFFICIENCY

James M. Ford, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 28, 1979, Ser. No. 24,749
Int. Cl.³ C25B *1/16, 13/08*
U.S. Cl. 204—98 **14 Claims**



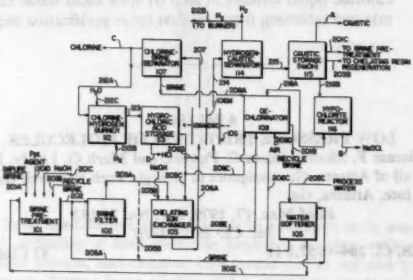
1. A process for the preparation of an alkali metal hydroxide from an alkali metal halide in at least two electrolytic cells having a first electrolytic cell and a last electrolytic cell physically arranged in series with respect to the flow of alkali metal hydroxide whereby the concentration of alkali metal hydroxide in said first cell is progressively increased toward a desired final concentration in said last cell, and employing in each electrolytic cell a permselective membrane, said permselective membrane employed in said last electrolytic cell corresponds to the concentration of alkali metal hydroxide produced in the catholyte chamber of said last electrolytic cell and being selected from the group consisting of single amine modified perfluorosulfonic acid film and a single unmodified perfluorosulfonic acid film, and said permselective membrane employed in said first electrolytic cell is a membrane different from that employed in said last electrolytic cell and is selected from the group consisting of sulfonic acid substituted perfluorocarbon polymers, primary amine modified perfluorocarbon polymers, di- or polyamine modified perfluorocarbon polymers, single perfluorosulfonic acid membranes prepared by laminating two perfluorosulfonic acid films of different equivalent weight, carboxylic acid substituted polymers, acrylic acid styrene copolymer crosslinked with divinyl benzene polymers, carboxylic acid membranes prepared by copolymerizing divinyl benzene with an anhydride, ester or acid chloride of acrylic acid and its derivatives in a solvent or solution, sulfostyrenated fluorinated ethylene propylene membranes and mixtures thereof.

4,242,185

PROCESS AND APPARATUS FOR CONTROLLING IMPURITIES AND POLLUTION FROM MEMBRANE CHLOR-ALKALI CELLS

Wayne A. McRae, Zurich, Switzerland, assignor to Ionics Inc., Watertown, Mass.

Filed Sep. 4, 1979, Ser. No. 72,543
Int. Cl.³ C25B *1/34, 9/00*
U.S. Cl. 204—98 **10 Claims**



1. A process wherein a substantially saturated aqueous alkali metal chloride brine, containing minor amounts of non-monovalent metallic cations, is electrolyzed in a multiplicity of membrane chlor-alkali cells having anode compartments containing anodes, said anodes capable of generating chlorine containing minor amounts of oxygen from aqueous chloride solution and a pH in the range of from about 0.5 to about 5, cathode compartments containing cathodes and substantially fluid impermeable, cation permselective perfluorocarbon membranes separating said anode compartments from said cathode compartments and wherein at least part of the gaseous chlorine effluent from said anode compartments is burned with a substantially chemically equivalent amount of the gaseous hydrogen effluent from said cathode compartments and thereafter absorbed in water to produce hydrochloric acid, which process comprises:

(a) as a first brine purification step, mixing said brine with at least one compound selected from the group consisting of phosphoric acid, alkali carbonates, alkali bicarbonates, alkali phosphates, alkali acid phosphates and mixtures thereof, adding a first portion of the alkali metal hydroxide liquid effluent from said cathode compartments to produce a pH of at least about 10 thereby precipitating a substantial portion of said non-monovalent cations, removing said precipitate and recovering the thus pretreated brine;

(b) as a subsequent brine purification step, contacting substantially all of the recovered brine of step (a) having a pH of at least about 9 with a chelating cation exchanger in the monovalent cation form thereby maintaining the concentration of any non-monovalent metallic cation in the brine effluent at a concentration of not more than about 2 parts per million;

(c) thereafter flowing said purified brine into said anode compartments and adding thereto a first portion of said hydrochloric acid so controlled as to maintain the pH of the liquid immediately effluent from said anode compartments in the range of from about 2 to about 4;

(d) maintaining the liquid effluent from said cathode compartments at a concentration of at least about 8 percent by weight of alkali metal hydroxide and at a temperature of at least about 70° C.;

(e) substantially regenerating said chelating exchanger with a second portion of said hydrochloric acid solution and thereafter contacting said exchanger with a second portion of the alkali metal hydroxide liquid effluent from said cathode compartment to substantially convert said exchanger to the alkali metal form;

(f) adjusting the pH of substantially all the liquid effluent from said anode compartments to a value less than or equal to about 2 by adding a third portion of such hydrochloric acid solution thereby substantially converting any hypochlorite therein to chlorine, thereafter removing and recovering dissolved chlorine in said liquid effluent to produce a low chlorine liquid effluent, and;

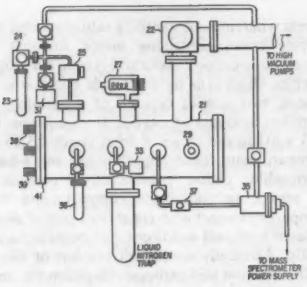
(g) substantially resaturating at least part of the resulting low chlorine liquid effluent of step (f) with alkali metal chloride and returning it to said first brine purification step.

4,242,186

LOW PRESSURE TRITIATION OF MOLECULES

Thomas F. Moran; James C. Powers, and Mark O. Lively, III, all of Atlanta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Mar. 27, 1979, Ser. No. 24,192
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 H **47 Claims**



1. A method for tritiating molecules, comprising:

depositing molecules of a substance to be tritiated on a supporting substrate in an evacuated vacuum chamber near, but not in the path of an electron beam which traverses said chamber;

admitting tritium gas into said chamber; and

subjecting said tritium to said electron beam thereby generating vibrationally excited tritium gas molecules and ions which collide and react with the deposited substance thus incorporating tritium atoms in said substance.

4,242,187

PREPARATION OF ALKANES SUBSTITUTED BY CHLORINE ATOMS AND/OR SULFOCHLORIDE GROUPS

Helmut Schlecht, Ludwigshafen; Volkmar Weberndoerfer, Mannheim, and Rudi Widder, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 8,156
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805441
Int. Cl.[3] B01J *1/10*
U.S. Cl. 204—162 SH **18 Claims**

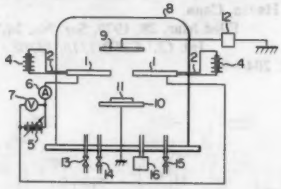
1. A process for the preparation of alkanes of more than 5 carbon atoms, which are substituted by chlorine atoms and/or sulfochloride groups, the number of substituents in the alkane molecule corresponding to the molar ratio of the starting materials, by the method of preparation of such compounds by reaction of alkanes with chlorine, or with chlorine and sulfur dioxide, by passing the alkanes, at a throughput from 0.1 to 30 kilograms per hour per liter of reaction space, and chlorine or chlorine and sulfur dioxide at a throughput of from 0.1 to 20 kilograms per hour per liter of reaction space, upward through a reaction chamber of which the lengthwise axis forms an angle of from 1.5 to 70° with the horizontal, the velocity of the gas layer being from 2 to 30 meters per second and the residence time of the gas layer in the reaction chamber being from 2 to 60 seconds, wherein, in the first part of the reaction chamber, which accounts for from 10 to 50 per cent of the total length of the lengthwise axis of the reaction chamber, the reaction mixture is irradiated with light principally of wavelengths of from 500 to 700 nanometers, and in the remaining part of the reaction chamber the reaction mixture is irradiated with light principally of wavelengths of from 200 to 500 nanometers.

4,242,188

METHOD FOR CONTROLLING PLASMA CHEMICAL REACTIONS

Masahiro Niinomi, Yokohama, and Kenji Yanagihara, Atsugi, both of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1979, Ser. No. 22,193
Claims priority, application Japan, Mar. 23, 1978, 53/33226
Int. Cl.[3] C22D *7/08*; C05D *7/00*; B01J *1/12*; B05D *1/00*
U.S. Cl. 204—164 **14 Claims**



1. A method for conducting a plasma chemical reaction involving at least one gaseous reactant, comprising:

generating a plasma of said at least one gaseous reactant under a given set of gas pressure, input power, and gas flow rate plasma conditions;

continuously monitoring at least one plasma constant with at least one probe formed from a metal of small thermionic electron emission characteristics, said probe being heated indirectly to a predetermined temperature by infrared rays or an electric heating means; and

controlling said plasma conditions so that the measured values of the plasma constants always coincide with the values of plasma constants previously obtained by said

probe necessary for effecting the intended chemical reaction.

4,242,189

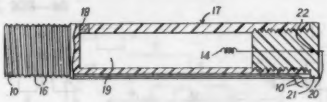
APPARATUS FOR MEASURING THE CONCENTRATIONS OF IONS

John V. Dobson, Hartlepool, England, assignor to National Research Development Corporation, London, England

Filed Jul. 12, 1974, Ser. No. 488,244

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—195 R **18 Claims**



1. Apparatus for use in measuring the concentration of a particular ion in a liquid, comprising:

an ion selective electrode which includes a metal capable of forming a hydride,

supply means for supplying hydrogen to the metal, the supply means being constructed to supply hydrogen, when the ion selective electrode is in contact with an electrolyte the ion concentration of which is to be measured, by electrolysis of the said electrolyte,

monitoring means for determining the concentration of hydrogen in the metal by monitoring a hydrogen concentration-related property of the metal and for providing an output signal dependent on the said concentration of hydrogen, and

control means for automatically controlling the times at which electrolysis is carried out by the supply means at least partially in accordance with the output signal of the monitoring means to maintain, when the ion sensitive electrode is in the said electrolyte, the said concentration of hydrogen in the metal within a predetermined range such that the electrode potential remains constant when measured in a solution having a constant concentration of the said particular ion.

4,242,190

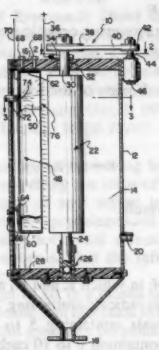
ROTARY ELECTRODIC TREATER WITH JET ACTION CLEANING

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed May 29, 1979, Ser. No. 42,774

Int. Cl.³ C02C *5/12*; C02B *1/82*; C25B *9/04*

U.S. Cl. 204—212 **5 Claims**



1. A device for electrically treating liquids comprising:

a treating chamber;

an electrically conductive inlet nozzle within the chamber for supplying liquid thereto for treatment;

an electrode within said chamber,

said electrode and said nozzle being connected across a source of electrical potential whereby to oppositely charge the same, p1 said nozzle being directed toward said electrode and positioned in relatively close proximity thereto so as to force the incoming liquid against said electrode in a jet action; and

means for effecting relative rotation between the nozzle and said electrode so as to progressively expose different portions of the surface of said electrode to the jet action of said nozzle.

4,242,191

ION SELECTIVE SENSOR AND METHOD OF MAKING SUCH SENSOR

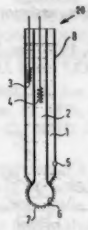
Johannes G. Schindler, Marburg, and Wilfried Schal, Bad Homburg, both of Fed. Rep. of Germany, assignors to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed May 8, 1979, Ser. No. 37,234

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820475

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—195 M **14 Claims**



1. In an ion-selective sensor for use in a medium to be analyzed, including a first electrode having a housing with a chamber therein, said chamber bein terminated at one end by an ion-conducting layer of glass and a second electrode unit, the improvement comprising an ion-selective membrane for determining the selectivity of said electrode unit disposed upon said ion-conducting layer of glass.

12. A method of manufacturing an ion-selective sensor as described in claim 1, comprising the steps of:

(a) dissolving an organic polymer together with ion-active substances in a suitable solvent;

(b) applying said polymer to said ion-conducting layer of glass; and

(c) allowing said polymer to dry.

4,242,192

ELECTROLYTIC STRIPPING CELL

Beverly W. Dunning, Jr., Adelphi, and D. Harry Chambers, Catonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

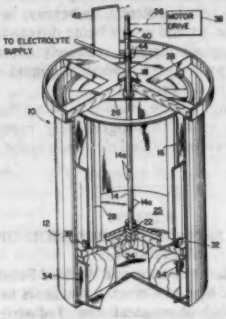
Filed Sep. 6, 1979, Ser. No. 72,956

Int. Cl.³ C25C *1/20, 7/00, 7/02*

U.S. Cl. 204—213 **12 Claims**

1. An electrolytic stripping cell for recovering silver and other metals from bulky, low density scrap containing such metals, said cell comprising: a rotatable perforated basket for receiving charge of said scrap and constituting one electrode of said cell; a metallic cylinder surrounding said basket and spaced therefrom, said cylinder constituting the other electrode; a housing in which said basket and said cylinder are

contained; means for supplying an electrolyte to said cell; and means for rotating said basket to provide agitation of the electrolyte within the cell, said means for supplying an electrolyte



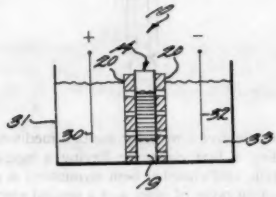
to said cell including a hollow shaft disposed centrally of the cell and having a plurality of openings along the length thereof through which said electrolyte passes.

4,242,193

LAYERED MEMBRANE AND PROCESSES UTILIZING SAME

Karl Moeglich, Dunedin, Fla., assignor to Innova, Inc., Clearwater, Fla.

Filed Nov. 6, 1978, Ser. No. 957,876
Int. Cl.[2] C25B *13/02*
U.S. Cl. 204—296 **30 Claims**



1. A membrane assembly for electrochemical processes comprising a plurality of layers of substantially void-free capillary material, each layer being thin enough so that it retards the passage of water therethrough, and thick enough so that it allows passage of ions and radicals therethrough, the capillary material having a positive angle of wetting; and

means for forming said capillary material into directed capillary channels allowing passage of anions and cations therethrough, and means for preventing crossflow of water and ions between said capillary channels.

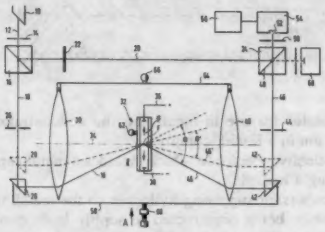
4,242,194

APPARATUS FOR SPECTROSCOPIC MEASUREMENT OF THE VELOCITY OF PARTICLES IN A FLUID

Rudolf Steiner, Muhltalerstr. 9, D-4000 Dusseldorf, and Raimund Kaufmann, Florastr. 14, D-4005 Meerbusch-Buderich, both of Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,371
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852978
Int. Cl.[3] G01N *27/26, 27/28, 33/16*
U.S. Cl. 204—299 R **36 Claims**

1. In apparatus for measuring the velocity in a predetermined direction of particles in a fluid by evaluation of an output signal created by heterodyning of a reference beam of electromagnetic radiation with a scattered beam formed from radiation scattered at a selected one of a plurality of scattering angles by said particles in said fluid, said apparatus comprising a measuring cell, a source of electromagnetic radiation, means for splitting said electromagnetic radiation into a measuring beam and a reference beam and for guiding said measuring beam to impinge upon said measuring cell at a predetermined incident angle, whereby said measuring beam is scattered by said particles at a plurality of scattering angles measured relative to said incident angle, movable selector means for picking up said scattered radiation at each of said selected scattering angles and creating scattered beams corresponding thereto, and means for mixing a first and second beam impinging at a



predetermined location upon said mixing means thereby creating a heterodyne signal, the improvement comprising

means for automatically controlling the direction of propagation of said reference beam and said scattered beams so that said reference beam and said selected one of said scattered beams impinge upon said predetermined location in said mixing means independently of the position of said movable selector means, whereby said mixing means mixes said reference beam with said selected scattering beam thereby creating said output signal without external adjustment of said direction of propagation of said reference beam.

4,242,195

EXTRACTION OF TAR SANDS OR OIL SHALE WITH ORGANIC SULFOXIDES OR SULFONES

Leslie R. Rudnick, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,950
Int. Cl.[3] C10G *1/100*
U.S. Cl. 208—11 LE **7 Claims**

1. A process for recovering organic matter from tar sands or oil shale comprising:

(A) mixing tar sand or oil shale with an extraction solvent comprising a sulfoxide of the formula:

$$R-\overset{\overset{O}{\|}}{S}-R_1 \ ;$$

a sulfone of the formula

$$R-SO_2-R_1$$

or a mixture thereof; in which R and R_1 are the same or different and are aliphatic radicals containing 3 to 10 carbon atoms, cycloaliphatic radicals containing 5 to 10 carbon atoms or aromatic radicals containing 6 to 10 carbon atoms; and

(B) separating said solvent containing dissolved organic matter from the sand or shale residue insoluble therein.

4,242,196

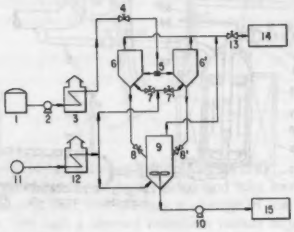
MASS PRODUCTION SYSTEM OF HIGHLY AROMATIC PETROLEUM PITCH

Takaaki Aiba, Iwaki; Ryoichi Takahashi, Tokyo; Takuji Hosoi, Kawashaki, and Tutomu Konno, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo; Sumikin Coke Co., Ltd, Wakayama and Sumitomo Metal Industries, Ltd., Osaka, all of, Japan

Continuation-in-part of Ser. No. 850,046, Dec. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 732,297, Oct. 14, 1976, abandoned. This application Oct. 27, 1978, Ser. No. 955,219

Int. Cl.³ C10G 9/14

U.S. Cl. 208—40 3 Claims



1. In a pitch production by thermal cracking including the steps of rapidly preheating a liquefied petroleum residuum to a temperature of 450°–520° C. by passing the same through a tubular heater for 0.5–15 minutes, feeding said preheated residuum through a feed flow line into a reaction vessel and thermally cracking the same by introducing an inert gas heated to a temperature of 400°–2,000° C. through a heating furnace into said reaction vessel for a direct contact with the residuum for 0.5–10 hours; the improvement comprising: feeding said preheated residuum through a plurality of parallel feed flow lines into a plurality of reaction vessels, the ratio of the number of feeding flow lines feeding said preheated residuum from said tubular heater into said reaction vessels to the total number of said reaction vessels being adjusted to be coincident with the ratio of the charging time (θC) required for charging a reaction vessel with a feeding flow of said preheated residuum to the total time (θT) required for carrying out one batch of thermal cracking in a reaction vessel where the ratio $\theta T/\theta C$ is adjusted to be greater than 1, thereby realizing steady and continuous operations in said tubular heater and said heating furnace.

4,242,197

METHOD OF AND APPARATUS FOR CLASSIFYING REFUSE

Peter Voelskow, Bad Kreuznach; Horst Rothert, Berlin, and Gustav Schlotterer, Düsseldorf, all of Fed. Rep. of Germany, assignors to Fritz-Aurel Goergen, Cologny, Switzerland

Filed Feb. 24, 1976, Ser. No. 661,028

Claims priority, application Switzerland, Feb. 27, 1975, 2471/75; Fed. Rep. of Germany, Oct. 8, 1975, 2544964

Int. Cl.³ B07B 15/00

U.S. Cl. 209—3 13 Claims

1. A method of treating refuse having light and heavy fractions, said method comprising the steps of:

introducing a stream of said refuse in raw and uncomminuted condition at a predetermined velocity in a predetermined generally horizontal direction into a substantially closed chamber so that the refuse stream drops in said chamber along a path;

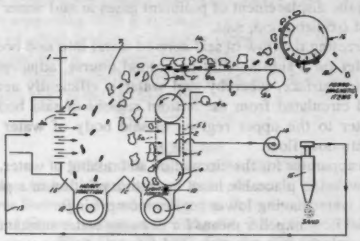
circulating a current of air in a closed circuit and generally horizontally opposite said direction through said chamber;

directing said current generally perpendicular to said path in said chamber;

passing said current after passage through said path through a continuous sieve surface extending perpendicular to said current in said chamber, whereby a portion of said light fraction adheres to said surface;

continuously displacing said surface across said circuit and stripping from said surface said portion adhering thereto;

collecting the remainder of said light fraction in said chamber at a location relatively close to said sieve surface and said heavy fraction in said chamber at a location relatively far from said sieve surface;



withdrawing a minor portion of the air in said closed circuit; and

filtering said portion and releasing it to the atmosphere.

4,242,198

REDUCTION OF MAGNESIUM AND OTHER CATIONS IN PHOSPHORIC ACID

Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 868,358, Jan. 10, 1978, abandoned. This application Mar. 12, 1979, Ser. No. 19,976

Int. Cl.³ B01D 15/04

U.S. Cl. 423—321 R 12 Claims

1. The method of removing Mg from crude wet-process phosphoric acid by passing the acid through a strong acid ion exchange resin bed characterized in that

(a) the phosphoric acid feed analyzes about 20 to 35% P_2O_5 and about 0.18 to 0.65 Mg as MgO, and is preclarified with sodium carbonate and a polyacrylamide flocculant to remove substantially all suspended organic and inorganic materials;

(b) a coating of a filter aid is added to inlet side of the resin bed prior to passage of the feed through the bed, to provide a filter cake for the collection of solids;

(c) the bed is back-washed to a point just below the layer of filter cake and solids, thereby disturbing the solids on top of the layer of filter aid as well as disturbing the filter aid;

(d) the solids on top of the layer of filter aid are removed; and

(e) the resin bed is back-washed at a rate sufficient to rearrange the resin beads so as to minimize short-circuiting during the next cycle.

4,242,199

AERATOR APPARATUS

Richard B. Kelley, Rockford, Ill., assignor to Richards of Rockford, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 968,439, Dec. 11, 1978, abandoned. This application May 18, 1979, Ser. No. 40,460

Int. Cl.³ B01F 3/04, 13/02; C02F 7/00

U.S. Cl. 210—758 13 Claims

1. A method for aerating and circulating a body of water having bottom regions including the steps of:

(1) drawing a flow of water from the bottom regions of said body of water;

(2) directing said flow of water through a conduit into a mixing chamber;

(3) injecting a pressurized oxidizing gas into said mixing

chamber from at least two divergent angles for contact with said flow of water, said oxidizing gas being injected through ports spaced circumferentially about said mixing chamber;

(4) causing turbulence in said flow of water with said injection of pressurized oxidizing gas, said turbulence increasing the displacement of pollutant gases in said water with said oxidizing gas; and,

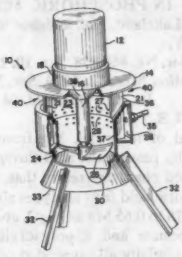
(5) directing the flow of said aerated water into said body of water on a substantially horizontal course, adjacent the water surface, whereby said water is efficiently aerated and circulated from the bottom regions of said body of water to the upper regions of said body of water in a continuous flow.

3. An apparatus for the circulation and mixing of water, said apparatus being placeable in an operative position in a parent body of water having lower regions comprising:

an axial flow impeller means for drawing water substantially beneath the water surface and from the lower regions of said parent body of water for maximum efficiency in the circulation of said water;

an impeller conduit for conducting the flow of water during rotation of said impeller means from an impeller inlet to an impeller outlet;

said impeller means being mounted within said impeller conduit;



means for rotating said impeller means and drawing said water through said apparatus;

intake means in communication with said impeller inlet for directing water drawn by said impeller means into said impeller conduit means;

a discharge area in communication with said impeller outlet for directing a maximum water flow from said impeller conduit into the surrounding parent body of water, said discharge area having directing means to restrict cavitation in said water flow and direct said water outward in a substantially horizontal flow underneath the surface of said parent body of water; and,

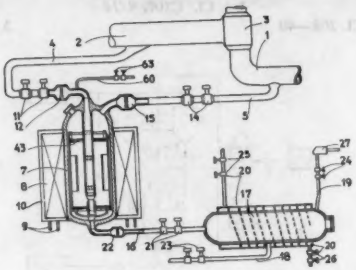
an enclosed chamber disposed generally circumferentially about said discharge area and having a common wall with said discharge area and said impeller conduit, said common wall having an axial portion and a portion diverging outwardly forming an inverted cone portion above said axial portion, ports being formed on each of said axial portion and said inverted cone portion for increased turbulence and mixing of said cleansing agent with said water, said enclosed chamber being pressurizable with a cleansing agent, said cleansing agent being injectable under pressure into said discharge area through each of said ports, causing turbulence and increased mixing of said water.

4,242,200

FILTERS FOR PURIFYING FLUIDS CONTAINING FERROMAGNETIC PARTICLES

Michel Dubourg, Le Mesnil Saint Denis, France, assignor to Framatome, Courbevoie, France

Filed Oct. 2, 1979, Ser. No. 81,092
Int. Cl.³ B01D 35/06
U.S. Cl. 210—222 **7 Claims**



1. A filter for purifying a fluid containing ferromagnetic particles, said filter comprising:

a cylindrical envelope having an inlet for connection to an inlet pipe for the fluid to be purified and an outlet for connection to an outlet pipe for the purified fluid;

ferromagnetic beads within said envelope and between which the fluid will, in use, pass;

a coil surrounding said cylindrical envelope and for connection to electric current supply means to produce a magnetic fluid for magnetising said beads so that said beads will, in use, retain ferromagnetic particles conveyed by the fluid;

an unclogging circuit communicating with the interior of said envelope;

a cylindrical basket for supporting said beads, arranged within said envelope and coaxial with said envelope, said basket being provided with perforations allowing the interior of said basket containing said steel beads to communicate with the space between said envelope and said basket and into which said outlet opens, said perforations being provided in zones of the side wall of said basket and at the ends of said basket;

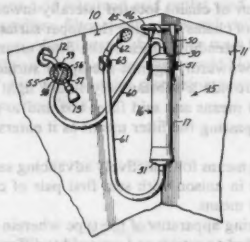
deflectors, arranged within said basket and having solid walls spaced inwardly of said side wall of said basket, and extending over a certain length in the axial direction, in that zone of said basket in which said beads are located; and

a central tube which is connected at one end to said inlet and is closed at its other end, and which is directed along the axis of said filter and arranged in the bed of beads in a central part of said basket, said tube having radially directed lateral perforations for placing the interior of said tube in communication with the interior of said basket in the zones of said tube which are located radially opposite said deflectors, said deflectors being arranged opposite said perforated zones of said side wall of said basket, which zones are located radially opposite said perforations in said central tube, in order to prevent fluid from passing directly, along a solely radial path, from said central tube to said space between said basket and said envelope.

4,242,201
BY-PASS WATER SOFTENER SYSTEM AND INSTALLATION

James B. Stephens, La Crescenta, and Charles G. Miller, Pasadena, both of Calif., assignors to TDV Co., Temple City, Calif.

Filed Jun. 14, 1979, Ser. No. 48,453
Int. Cl.³ C02B 1/16
U.S. Cl. 210—240 22 Claims



1. A by-pass water softener system comprising:

a water softener comprising an elongated tube having a first and a second end, for holding a change of ion exchange resin, a first and a second retention means adjacent said respective first and second ends, said retention means having perforations for passage of water which are sized to retain said resin in said tube, a first and a second end cap sealingly and structurally attached to the tube so as to close said respective first and second ends, each of said end caps having a port passing therethrough, and first and second hose attachment means at respective first and second ports;

suspension means attachable to said water softener;

a diverter valve having an inlet port, a first and a second outlet port, and selector means for directing water from said inlet port to a selected one of said outlet ports, said inlet port being connectible to a water supply, said first outlet port being connectible to a first water distributor;

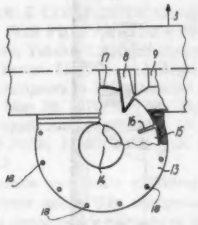
a first flexible hose connected to said second outlet port and to said first hose attachment means; and

a second flexible hose connected at one of its ends to said second hose attachment means, its other said end being unattached to fixed structure so it is free for spatial movement relative to said tube.

4,242,202
APPARATUS FOR TAKING UP OIL FROM A WATER SURFACE

Knut G. Carlsson, Vadum, Denmark, assignor to A/S De Smithske, Nørresundby, Denmark

Filed Jul. 12, 1979, Ser. No. 57,032
Claims priority, application Sweden, Aug. 14, 1978, 7808596
Int. Cl.³ E02B 15/04
U.S. Cl. 210—242.3 4 Claims

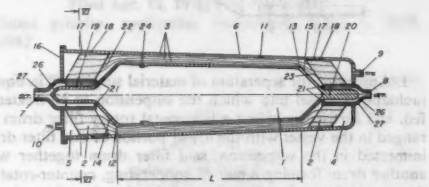


1. Apparatus for taking up oil from a water surface, incorporating a floating body comprising a suction funnel, the upper edge of which is vertically adjustable by variation of the buoyancy of the body, and a pumping device for removing the skimmed oil from the lower region of the funnel, said pumping device consisting of a conveyor screw having a driven shaft and extending from the lower region of the suction funnel towards a discharge aperture with a hose connector, the conveyor screw intermediate the funnel and the discharge aperture cooperating with a restrainer and scraper disc, the main plane of which is at least almost coincident with the axis of the conveyor screw, the periphery of the disc being spaced only slightly from the shaft of the screw and having notches matching with the thread of the screw.

4,242,203
HOLLOW FIBRE APPARATUS

Charles Amicel, Carrieres sur Seine; Bernard Biot, Crapoane; Yves Butruille, Ferrol-Attilly, and Christian Ollivier, Vienne, all of France, assignors to Sodip SA, Meyzieu, France

Filed Dec. 27, 1977, Ser. No. 865,100
Claims priority, application France, Dec. 24, 1976, 76 39695
Int. Cl.³ B01D 31/00
U.S. Cl. 210—321.1 13 Claims



11. A hollow fiber apparatus for the fractionation of a fluid, comprising an elongated mandrel, longitudinally spaced sealing elements located about two end sections of the mandrel and defining longitudinally spaced inner and outer sides, the inner side of each sealing element being inclined in relation to the longitudinal axis of the mandrel, a plurality of semipermeable hollow fibers arranged about the mandrel and passing seallingly through the longitudinally spaced sealing elements so that open ends of the hollow fibers are exposed at the longitudinally spaced outer sides of the sealing elements, a housing comprising an elongated section enclosing the hollow fibers with the sealing elements sealing against the inside wall of the elongated sections of the housing, whereby a fluid flow chamber comprising the hollow fibers is defined between the longitudinally spaced inner sides of the sealing elements and the outer surface of the mandrel, the housing additionally comprising end sections enclosing the outer sides of the longitudinally spaced sealing elements, each sealing element comprising a ribbon wound around the mandrel, the hollow fibers being secured between spirals of the ribbon by means of a sealing agent;

the mandrel in the chamber having a cross-section greater near the inner wall of each sealing element than at the place where is situated the adjacent sealing element, the cross-section of the mandrel increasing progressively in each of the two so defined regions, whereby a fluid distribution enclosure and a fluid collection enclosure communicating with the open ends of the hollow fibers are defined between the longitudinally spaced outer surfaces of the sealing elements and end sections of the housing, a first fluid inlet leading into the fluid distribution enclosure and a first fluid outlet leading from the fluid collection enclosure, whereby a fluid may be passed through the inside of the hollow fibers, a second fluid inlet leading into the fluid flow chamber and a second fluid outlet leading from such chamber, each of said second fluid inlet and second fluid outlet communicating with the fluid flow chamber via a conduit leading through an end section of the housing and through a sealing element and opening into the fluid flow

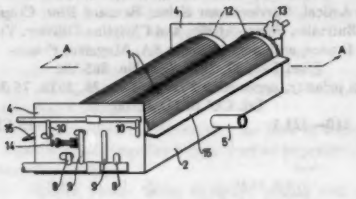
chamber adjacent an inner side of a sealing element where the cross-section of the mandrel progressively increases, whereby a fluid may be passed through the fluid chamber about the outer surfaces of the hollow fibers and the mandrel.

4,242,204

APPARATUS FOR SEPARATION OF MATERIAL SUSPENDED IN LIQUIDS

Åke Stigebrandt, Lillbräckegatan 15, Uddevalla, Sweden (S-451 00)

Filed Apr. 3, 1979, Ser. No. 26,797
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—326 **8 Claims**



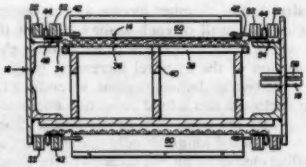
1. Apparatus for separation of material suspended in liquids including a vessel into which the suspension to be treated is fed, and further including a horizontal rotary filter drum arranged in the vessel with the lower portion of said filter drum immersed in the suspension, said filter drum together with another drum forming a pair of cooperating, counter-rotating drums said drums forming a nip and the direction of rotation of said drums being such that any sludge coating on said filter drum is mechanically compressed, said filter drum being rotatably mounted on two stationary end carrier means which seal against the drum envelope surface, a stationary shield arrangement mounted on said carrier means within said filter drum, said shield arrangement sealing against the drum envelope surface and dividing the interior volume defined by the drum envelope surface and the end carrier means into sections, and means for connecting at least one of said sections to a vacuum source for reducing the air pressure in that section.

4,242,205

TRAVELING BELT FILTER

Gene Hirs, 6865 Meadow Lake Dr., Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 9,725, Feb. 6, 1979, which is a continuation-in-part of Ser. No. 952,030, Oct. 16, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,396
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—400 **8 Claims**



1. In a filtering apparatus of the type wherein contaminated liquid is supplied to a tank and caused by differential pressure to flow through a submerged perforate filter means into the inlet in the top wall of a submerged filter box, the filter means including an endless loop perforate filter belt which circumscribes the filter box, means for removing filtrate liquid from the filter box, and wherein a power driven conveyor selectively advances the normally stationary filter means in response to a build-up of dirt thereon to bring clean filter means into registry with a filter box inlet, the improvement which comprises:

the power-driven conveyor comprising a first pair of chains located adjacent the respective longitudinally extending edges of the filter belt and spaced laterally outwardly therefrom, and belt-attaching means securing the filter belt to said first pair of chains for advancing the filter belt therewith;

a second pair of chains located laterally inwardly from said first pair of chains engaging the upper surface of the longitudinally extending edges of the filter means to hold said edges downwardly against the upper surface of the filter box to provide a substantially liquid tight seal between said filter means and said filter box and to prevent liquid from by-passing the filter means as it enters the filter box inlet;

and driving means for selectively advancing said second pair of chains in unison with said first pair of chains and the filter belt means.

8. In a filtering apparatus of the type wherein contaminated liquid is supplied to a tank and caused by differential pressure to flow through a submerged perforate filter means into the inlet in the top wall of a submerged filter box, the filter means including an endless loop perforate filter belt which circumscribes the filter box, means for removing filtrate liquid from the filter box, and wherein a power driven conveyor selectively advances the normally stationary filter means in response to a build-up of dirt thereon to bring clean filter means into registry with a filter box inlet, the improvement which comprises:

the power-driven conveyor comprising a first pair of chains formed in a closed loop located adjacent the respective longitudinally extending edges of the filter belt and spaced laterally outwardly therefrom, and belt-attaching means securing the filter belt to said first pair of chains for advancing the filter belt therewith;

a closed loop longitudinally extending sealing means connected to said power driven conveyor for movement with said filter belt, said sealing means engaging the longitudinal edges of said filter belt to urge said edges into sealing engagement with the top wall of the filter box;

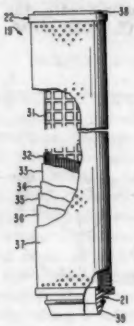
and said filter belt being formed of non-metallic fabric material.

4,242,206

FILTER DEHYDRATOR

John C. Estabrooke, Campbell, Calif., assignor to Velcon Filters, Inc., San Jose, Calif.

Filed Oct. 26, 1978, Ser. No. 955,016
Int. Cl.² B01D *27/04*
U.S. Cl. 210—489 **5 Claims**



1. A filter dehydrator comprising:

an element having an inlet for fluid to be filtered and an outlet for filtered fluid,

a confined passageway establishing communication between said inlet and said outlet,

a mass of water absorptive cellulosic fibers comprising a water-insoluble cross-linked carboxymethyl cellulose fiber medium disposed within said passage permitting the passage of hydrocarbon fluids therethrough while swelling upon the presence of free water to block the flow of fluid between said inlet and said outlet, and

a fiberglass medium filter means disposed within said passage upstream of said water absorptive mass for removing substantially all solid particles that would block the active surface of said mass and for dispersing water droplets in the hydrocarbon fluid.

4,242,207

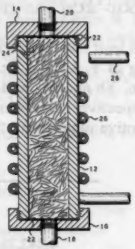
FILTER AND FLUID ANALYSIS SYSTEM

Gregory A. Ford, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 25, 1979, Ser. No. 6,955

Int. Cl.³ B01D *39/06*

U.S. Cl. 210—500.1 **20 Claims**



1. A regenerable filter for use in removing low molecular weight polymers from a fluid stream comprising a receptacle having an inlet and an outlet, a filter bed lying between said inlet and said outlet wherein said filter bed comprises particles of synthetic polymer selected from polytetrafluoroethylene and polyarylene sulfide which at the temperature employed in the filter does not melt or react with or dissolve in the fluid sample.

4,242,208

SEMIPERMEABLE COMPOSITE MEMBRANE AND PROCESS FOR PREPARATION THEREOF

Takeyuki Kawaguchi; Yutaka Taketani; Hiroyoshi Minematsu; Noriaki Sasaki; Yuzuru Hayashi, and Shigeyoshi Hara, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

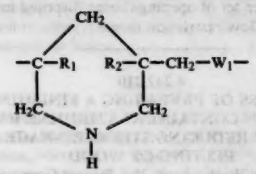
Filed May 16, 1979, Ser. No. 39,559

Claims priority, application Japan, May 22, 1978, 53-59881

Int. Cl.³ B01D *39/00, 13/00;* B05D *5/00;* C08C *19/22*

U.S. Cl. 210—500.2 **42 Claims**

1. A semipermeable composite membrane comprising a microporous substrate and a thin semipermeable film of a polymeric material deposited on one side of the substrate, said thin semipermeable film being prepared by interfacial cross-linking of a polymer containing a recurring unit of the formula



(I)

wherein each of R_1 and R_2 represents a hydrogen atom or a methyl group, and W_1 represents a direct bonding or a sulfonyl group (—SO_2—), with a polyfunctional compound containing at least two functional groups selected from acid halide, sulfonyl halide, isocyanate, N-haloformyl, haloformate and acid anhydride groups.

4,242,209

APPARATUS FOR SEPARATING MIXTURES OF LIQUIDS OF DIFFERENT SPECIFIC GRAVITIES, ETC.

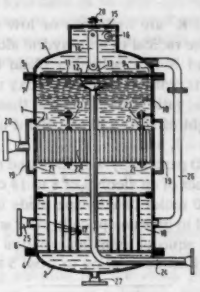
Alfonsus A. Geurtsen, Deventer, Netherlands, assignor to Machinefabriek Geurtsen Deventer B.V., Deventer, Netherlands

Filed Apr. 18, 1979, Ser. No. 31,292

Claims priority, application Netherlands, May 9, 1978, 7804982

Int. Cl.³ B01D *21/10*

U.S. Cl. 210—519 **9 Claims**



1. Shipboard apparatus for separating a mixture of immiscible liquids having different specific gravities while avoiding turbulences due to ship motion, comprising, in combination:

a vessel defining a vertically extending settling chamber;

means disposed between the upper and lower regions of said chamber for introducing the mixture of immiscible liquids quiescently into an intermediate region of said chamber whereby the lighter liquid tends to rise in said chamber while the heavier liquid tends to settle in said chamber;

first outlet means having an inlet communicating with the upper region of said chamber for withdrawing said lighter liquid;

second outlet means having an inlet communicating with the lower region of said chamber for withdrawing said heavier liquid; and

flow restriction means substantially filling the cross section of said chamber at said intermediate region between said upper and lower regions of said chamber and presenting vertical passages directly communicating said upper and lower regions for restricting liquid surging between said regions whereby to maintain quiescent conditions in such regions;

said means for introducing the mixture comprising an annular chamber surrounding said intermediate region and having two sets of circumferentially spaced openings for uniformly introducing the mixture of immiscible liquids around said settling chamber, one set of openings being

disposed immediately above said flow restriction means and the other set of openings being disposed immediately below said flow restriction means.

4,242,210

PROCESS OF PREPARING A FINISHING COMPOSITION CONTAINING AZIRIDINE RADICALS USED FOR REDUCING THE SHRINKAGE AND FELTING OF WOOD

Friedrich Reinert, Wachenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 38,849

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824469

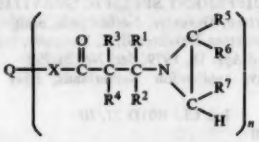
Int. Cl.³ D06M *13/48, 15/52;* D08G *65/00*

U.S. Cl. 252—8.8 **5 Claims**

1. A process for preparing a finishing agent for reducing the shrinkage and felting of wool which comprises:

dissolving (a) a compound of the formula I

I



where R^1 to R^7 are hydrogen or low molecular weight alkyl, Q is the radical of an n-hydric alcohol or phenol, n is 2 or 3 and X is a polyether chain of butoxy and/or propoxy units, with or without ethoxy units, which chain has an atomic ratio C:O of not less than 2.67:1 and a molecular weight of from 150 to 1,500 if n=2 and from 150 to 3,000 if n=3, and

(b) from 2 to 20 percent by weight, based on said compound I, of an adduct of an alcohol of 8 to 18 carbon atoms with from 5 to 80 moles of ethylene oxide in sufficient dilute aqueous acid to give an optically clear solution, and thereafter adding aqueous ammonia solution to the solution to bring the pH of the solution to from 5 to 10.

4,242,211

LUBRICANT FOR METAL WORKING

Torao Nagura, Yokohama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1979, Ser. No. 10,168

Claims priority, application Japan, Feb. 7, 1978, 53/11952; Feb. 7, 1978, 53/11953

Int. Cl.³ C10M *1/10*

U.S. Cl. 252—25 **19 Claims**

1. A water soluble paste for metal working consisting essentially of polyethylene oxide and water.

4,242,212

MANNICH ADDITIVES MODIFIED BY DITERTIARY ALKYL PHENOL

Joseph B. Hanson, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 9, 1979, Ser. No. 28,567

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—51.5 R **8 Claims**

1. A composition comprising the Mannich reaction product of a ditertiary alkylphenol, formaldehyde or a formaldehyde-yielding compound, a polyamine, and a substantially hydrocarbon compound having at least one active or acidic hydrogen comprising a para-mono-alkylphenol or an oxidized olefinic polymer, wherein the reaction product is formed a a temperature of about 30° C. to 300° C.

4,242,213

DIELECTRIC CERAMIC COMPOSITIONS BASED ON MAGNESIUM, CALCIUM AND RARE EARTH METAL TITANATES

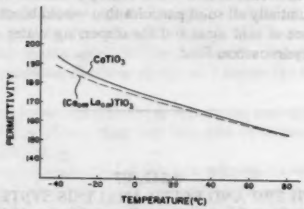
Hiroshi Tamura, and Masayoshi Katsube, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 19, 1979, Ser. No. 31,436

Claims priority, application Japan, Apr. 19, 1978, 53/46875

Int. Cl.³ H01B *3/12*

U.S. Cl. 106—73.3 **1 Claim**



1. A dielectric ceramic composition for microwave applications consisting essentially of a mixture represented by the general formula:

$$(1-x)MgTiO_3-x(Ca_{1-y}Me_y)TiO_3$$

wherein Me is at least one rare earth element selected from the group consisting of Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, and wherein x and y are molar fractions of respective components with values within the following respective ranges: $0.03 \leqq x \leqq 0.15$, $0.001 \leqq y \leqq 0.06$.

4,242,214

ANTIFREEZE COMPOSITION CONTAINING A CORROSION INHIBITOR COMBINATION

Clifford L. Lambert, Jr., Georgetown, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 909,735, May 25, 1978, abandoned. This application Oct. 17, 1979, Ser. No. 85,835

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—75 **10 Claims**

1. A corrosion inhibited antifreeze composition consisting essentially of a water soluble liquid alcohol freezing point depressant and an inhibitor combination consisting essentially of the following components wherein the concentration ranges of the inhibitor components are weight percent of said composition:

about 0.5 to 2.5 percent tetraborate ion,
about 0.5 to 2.5 percent benzoate ion,
about 0.05 to 1.0 percent metaborate ion,
about 0.02 to 0.8 percent metasilicate ion and
about 0.05 to 0.6 percent tolyltriazole.

5. A corrosion inhibited antifreeze composition consisting essentially of a water soluble liquid alcohol freezing point depressant and an inhibitor combination consisting essentially of the following components wherein the concentration ranges of the inhibitor components are weight percent of said composition:

about 0.5 to 2.5 percent tetraborate ion,
about 0.5 to 2.5 percent benzoate ion,
about 0.05 to 1.0 percent metaborate ion,
about 0.02 to 0.8 percent metasilicate ion and
about 0.05 to 0.6 percent benzotriazole.

4,242,215
SUBSTANTIALLY ENVIRONMENTAL-POLLUTION-FREE LAUNDRY DETERGENT COMPOSITION

Jacob K. Smid, and Johan G. Aalbers, both of Bodegraven, Netherlands, assignors to Chem-y, Fabriek Van Chemische Produkten B.V., Bodegraven, Netherlands

Continuation of Ser. No. 368,361, Jun. 8, 1973, abandoned. This application Oct. 31, 1978, Ser. No. 956,424

Claims priority, application United Kingdom, Jun. 13, 1972, 27618/72

Int. Cl.³ C11D *3/60*

U.S. Cl. 252—100 **9 Claims**

1. A substantially environmental-pollution-free detergent composition consisting essentially of about 10–15% by weight of at least one surfactant, about 30–70% by weight of at least one builder, about 15 to 35% by weight of perborate, about 0.5 to 2% by weight of cellulose derivative, and a member selected from the group consisting of (a) acidic substances acceptable in detergent compositions and having a pK value of at least 2, and (b) compounds which in aqueous solutions of said compositions form said substance in situ, said member being present in a sufficient amount such that a 0.5% aqueous solution of said composition has an initial pH of 5.0–8.5, measured at room temperature, said detergent composition containing no more than 5% phosphate.

4,242,216
STABILIZED DICHLORODIMETHYL HYDANTOIN

Denny E. Daugherty, West Chester; Edwin R. Loder, and Gary L. Young, both of Cincinnati, all of Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

Filed Sep. 27, 1979, Ser. No. 79,430

Int. Cl.³ C11D *7/56, 7/54*

U.S. Cl. 252—103 **3 Claims**

1. A dry alkaline powdered dishmachine detergent consisting essentially of:

0–50% Sodium carbonate
0–50% Sodium tripolyphosphate
0–90% Sodium chloride or sodium sulfate
0–15% Sodium metasilicate, anhydrous
0–30% Sodium hydroxide
0–5% Wetting agent
0.1–90% 1,3-dichloro-5,5-dimethylhydantoin

with the proviso that the composition contains at least 10% of one or more alkaline compounds selected from the group consisting of sodium carbonate, tripolyphosphate, metasilicate, or hydroxide; the said hydantoin derivative consisting of praticles in the −10+100 mesh range, U.S. screen, compacted at a pressure in the range of about 1000 to 200,000 psi, whereby chlorine loss on storage for 90 days is not more than about 2%.

4,242,217
COMPOSITION SUITABLE FOR USE IN CLEANING PANES OF GLASS

Lothar Westermann, Cologne, and Horst-Dieter Wasel-Nielen, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,324

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1978, 2806344

Int. Cl.³ C11D *3/065, 3/075*

U.S. Cl. 252—135 **7 Claims**

1. Composition suitable for use in cleaning panes of glass, consisting of a substantially homogeneous surfactant and binder containing blend, in the form of a hardened moulding, the blend containing:

(a) at least one water-soluble alkali metal phosphate;
(b) at least one anion-active surfactant or non-ionic surfactant or both;
(c) an alkali metal silicate, with or without water admixed therewith;
(d) a product obtained by reacting P_4O_{10} with n-butanol and ethylene glycol in a molar ratio equal to about 1:2:2;
(e) the composition being with or without a complex former or a solvent or both.

4,242,218
PHENOL-FREE PHOTORESIST STRIPPER

John E. Vander Mey, Stirling, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

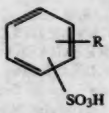
Continuation-in-part of Ser. No. 689,718, May 24, 1976, abandoned, which is a continuation of Ser. No. 601,574, Aug. 1, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 740,154

Int. Cl.² C23G *5/02*; G03C *11/12*

U.S. Cl. 252—143 **22 Claims**

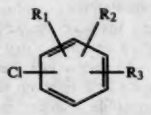
1. A stripping solution for removing polymeric organic substances from an inorganic substrate, said solution being essentially free of phenol compounds and comprising:

30–80 weight percent of an aryl sulfonic acid having the formula



wherein R is hydrogen or an alkyl group containing 1 to 14 carbon atoms or mixtures thereof, and

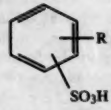
20–70 weight percent of a solvent which includes a chlorinated aryl compound of the formula



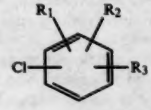
wherein R_1, R_2 and R_3 are each independently H, Cl or alkyl, and R_1, R_2 and R_3 together have 0–5 carbons.

19. A stripping solution for removing polymeric organic substances from an inorganic substrate, said solution being essentially free of phenol compounds and comprising:

30–80 weight percent of a mixture or aryl sulfonic acids of the formula



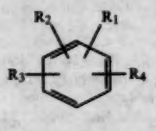
wherein R is hydrogen or an alkyl group containing 1 to 14 carbon atoms, said mixture of aryl sulfonic acids including dodecylbenzene sulfonic acid and toluene sulfonic acid, in admixture with 20–70 weight percent of a solvent which is chlorinated aryl compound of the formula



where R_1, R_2 and R_3 are each independently H, Cl or alkyl, and R_1, R_2 and R_3 together have 0–5 carbons; an isoparaffinic hydrocarbon having an average molecular

weight between 150 and 210 and a boiling point between 160° and 220° C.;

an alkylaryl compound of the formula



where R_1 is an alkyl group, R_2, R_3 and R_4 are independently hydrogen or an alkyl group and R_1, R_2, and R_3 and R_4 together contain 1–14 carbon atoms; or mixtures thereof;

said composition including 10–60 weight percent of at least one of said chlorinated aryl compounds and 10–60 weight percent of at least one of said alkylaryl compounds.

4,242,219

NOVEL ENZYME PARTICLES AND THEIR PREPARATION

Pieter K. Bogerman, Naaldwijk; Petrus J. Eygermans, Wateringen, and Antoon G. van Velzen, The Hague, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Jun. 26, 1978, Ser. No. 919,082

Claims priority, application United Kingdom, Jul. 20, 1977, 30556/77

Int. Cl.³ A61K *37/48*; C11D *3/386*; C12N *9/96, 9/98*

U.S. Cl. 252—174.12 **33 Claims**

1. A process for the preparation of enzyme-containing particles which do not, or substantially do not, dust when subjected to external mechanical pressure comprising homogeneously mixing an amount of an enzyme in dry or substantially dry form sufficient to give the desired enzyme activity in the particles when formed, about 20% to about 60% of a hydrophilic organic cohesive compatible with the enzyme selected from the group consisting of starch derivatives, cellulose derivatives, arabic gum, karaya gum and tragacanth, about 10% to about 60% of a building agent suitable for use in enzyme compositions selected from the group consisting of water-soluble carbohydrates of 5 to 12 carbon atoms, up to 70% of which may be replaced by a starch hydrolysate of about 20 to about 70 DE, and an amount of a moisture regulating agent selected from the group consisting of polyols having 2 to 6 carbon atoms and 2 to 4 hydroxy groups attached to different carbon atoms sufficient to maintain a moisture content in the particles formed of from 5% to 15% at ordinary temperatures and ordinary relative humidities and sufficient water to give a moisture content in the particles formed of from 5% to 15%, mechanically dividing the mixture obtained into particles of the desired size, and coating the particles to prevent loss of moisture with about 0.5 to about 5% of a water repellent agent selected from the group consisting of paraffin oil, linseed oil, earth wax, cocoa fat, candelilla wax, carnauba wax, paraffin wax and beeswax, ceresine wax and lanolin and mixtures thereof.

29. An enzyme-containing composition comprising an enzyme in dry or substantially dry form, about 20% to about 60% of a hydrophilic organic cohesive compatible with the enzyme selected from the group consisting of starch and cellulose derivatives, arabic gum, karaya gum and tragacanth, about 10% to about 60% of a building agent suitable for use in enzyme compositions, and an amount of a moisture regulating agent selected from the group consisting of polyols having 2 to 6 carbon atoms and 2 to 4 hydroxy groups attached to different carbon atoms sufficient to maintain a moisture content in the particles formed of from 5% to 15% at ordinary temperatures and ordinary relative humidities and a small amount of water.

4,242,220

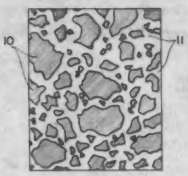
WASTE DISPOSAL METHOD USING MICROWAVES

Gentaku Sato, No. 33, Ichigaya Sanai-cho, Shinjuku-ku, Tokyo, Japan (162)

Filed Jul. 31, 1978, Ser. No. 929,808

Int. Cl.² G21F *9/08*

U.S. Cl. 252—301.1 W **8 Claims**



1. A method of manufacturing a safe article from a water-containing waste having poisonous substances, comprising the steps of:

(a) removing a major portion of water contained in the waste,

(b) stirring the waste during the subsequent steps except for the last step,

(c) drying the waste to a residual water content of about 12–13% by weight, without igniting flammable material contained in the waste,

(d) microwave heating the waste to further reduce the residual water content to 0.1–5% by weight so that the waste becomes powdery,

(e) cooling the waste powder to room temperature,

(f) contacting the waste powder with a thermoplastic resin,

(g) microwave heating the mixture of the waste powder and the thermoplastic resin at a rate which enables the resin to melt and encapsulate the waste powder particles, and

(h) molding the resin encapsulated particles into an article having a desired shape.

4,242,221

CERAMIC-LIKE SCINTILLATORS

Dominic A. Cusano; Fred F. Holub, both of Schenectady, and Svante Prochazka, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,085

Int. Cl.³ C04B *35/50*

U.S. Cl. 252—301.4 H **27 Claims**

1. A process for producing optically translucent scintillation detectors, said detector comprising phosphor material selected from the group consisting of BaFCl:Eu, LaOBr:Tb, CsI:Tl, $CaWO_4$, and $CdWO_4$; said process comprising the step of:

pressing the phosphor material at a substantially high pressure and at an elevated temperature which is below the melting point of the phosphor and for a time sufficient to allow compaction whereby an optically translucent body is formed.

4,242,222

RADIOENZYMATIC ASSAY OF CATECHOLAMINES

Garland A. Johnson, Charleston Township, Kalamazoo County, and Jacob D. Peuler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 681,999, Apr. 30, 1976, abandoned. This application Oct. 12, 1978, Ser. No. 950,863
Int. Cl.[2] G01J 1/00
U.S. Cl. 252—301.17 3 Claims

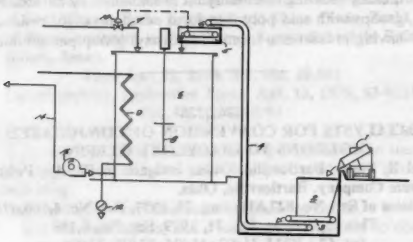
1. A composition which comprises a liquid scintillation vial and contents, said contents comprising an organic layer and an aqueous layer, said organic layer or component thereof substantially immiscible with the aqueous layer, the organic layer comprising an organic liquid scintillation medium and vanillin, said vanillin bearing a tritium label in the methoxy position, the aqueous layer comprising water in admixture with an acid of sufficient strength to protonate the amine function of a catecholamine.

4,242,223

PROCESS FOR RECEIVING, STORING AND HANDLING ALUMINUM HYDROXIDE WET HYDRATE

Hans Christner, Frankfurt; Wolfgang Roebke, Bruhl; Hermann Ramelow, Kelkheim, and Ewald Dittrich, Grossekrotzenburg, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,692
Int. Cl.[3] C09D 1/00; B01J 13/00
U.S. Cl. 252—313 R 14 Claims



1. A process of forming a suspension of aluminum hydroxide wet hydrate stable for a period of at least 48 hours consisting essentially of adding a measured amount of aluminum hydroxide wet hydrate to a container and adding to the aluminum hydroxide wet hydrate an amount of aqueous sodium hydroxide sufficient to form a suspension stable against sedimentation with said measured amount of aluminum hydroxide wet hydrate.

5. A suspension made by the process of claim 2 which suspension has been stable for at least 48 hours and still has good meterability.

6. A process for receiving, storing and handling aluminum hydroxide wet hydrate consisting essentially of dumping the aluminum hydroxide wet hydrate into a container, passing the aluminum hydroxide wet hydrate from the container to a conveyor, conveying the aluminum hydroxide wet hydrate to means for measuring the amount of aluminum hydroxide wet hydrate, adding the measured amount of aluminum hydroxide wet hydrate to a container, mixing the aluminum hydroxide wet hydrate in the container with the amount of aqueous sodium hydroxide needed to produce a stable suspension of the aluminum hydroxide wet hydrate and producing a pumpable and meterable suspension of the aluminum hyroxide wet hydrate in said container by heating the aluminum hydroxide wet hydrate-aqueous sodium hyroxide mixture in the container to a temperature between 20° and 100° C. and stirring said mixture.

4,242,224

COLOR STABILIZATION OF AMINE ANTIOXIDANT AND ANTIOZONANT EMULSIONS

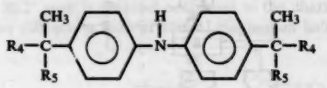
Paul R. Dean, II, Cuyahoga Falls, and Joseph A. Kuczkowski, Munroe Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 944,686, Sep. 22, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,593
Int. Cl.[3] C09K 15/26
U.S. Cl. 252—402 7 Claims

1. A color-stabilized composition comprising a combination of:

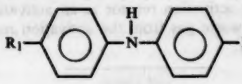
1. an amine age resister comprising an antioxidant or antiozonant selected from the group consisting of:

a. p-styrenated diphenylamines having the formula:



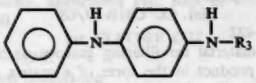
wherein R_4 is selected from phenyl and p-tolyl radicals, and R_5 is selected from H, and methyl;

b. alkylated diphenylamine derivatives having the formula:



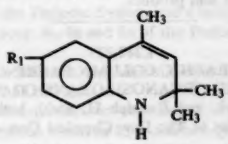
wherein R_1 and R_2 are alkyl radicals (2–12C);

c. N-phenyl, N'-alkyl-p-phenylenediamines having the following formula:



wherein R_3 is an alkyl radical (2–8C); and

d. dihydroquinolines having the formula



wherein R_1 is an alkyl radical having 2 to 12 carbon atoms (2–12C):

with:

2. a reducing agent which is also a hydrogen donor selected from the group consisting of:

a. dialkylhydroxylamines (2–12C), and

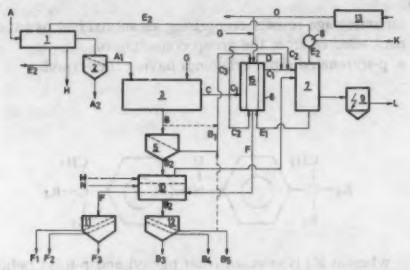
b. mercaptans selected from the group consisting of alkyl, phenyl, and aralkyl mercaptans,

3. at a ratio of from 0.1 to 5 parts by weight reducing agent per 100 parts by weight amine age resister.

4,242,225
METHOD AND APPARATUS FOR PRODUCING ACTIVE COKE

Erhard Wolfrum, Neue Aue 6, 5160 Düren (Rheinland), Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,774
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808995
Int. Cl.³ B01J *37/08*; C10B *31/10, 49/04*
U.S. Cl. 252—411 R **10 Claims**



1. A method of producing active coke by thermal treatment of coal-base feed material, comprising coking the feed material in a hearth-type furnace, feeding at least a portion of the resulting coke of the desired grain size into an activation reactor, passing at least a portion of the waste gas from the hearth-type furnace into the activation reactor as an activation gas, and passing the hot waste gas from the activation reactor into a waste-heat boiler.

4,242,226
FILTER MATERIAL AND A METHOD OF MANUFACTURING AND USING THE SAME

Matti J. Siren, Casa Maria Helena, Via Monte Cucco, 6596 Gordola, Switzerland

Filed Feb. 21, 1979, Ser. No. 13,442
Claims priority, application Sweden, Feb. 21, 1978, 7802006; Feb. 21, 1978, 7802007
Int. Cl.³ C01B *31/08*
U.S. Cl. 252—422 **30 Claims**

1. A filter material for filtering gaseous or liquid media, comprising a product in the form of a matrix of activated carbon having uniformly dispersed therein at least one metal selected from the group consisting of Ca, Mg, Ba, Al, Cu and the transition metals, said product formed by chemical reaction between cations of at least one metal from said group of metals and anionic groups chemically bound to a substance consisting essentially of a polyhexose derivative followed by pyrolysis and activation of said product.

4,242,227
CHROMATOGRAPHIC COLUMN PACKING HAVING A BONDED ORGANOSILOXANE COATING

Terry J. Nestrick, and Rudolph H. Stehl, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 31, 1979, Ser. No. 62,380
Int. Cl.³ B01J *31/02, 49/00*
U.S. Cl. 252—428 **19 Claims**

1. In a process for making a chromatographic column packing by chemically bonding a siloxane polymer coating to the surface of a siliceous solid, the improvement which comprises the combination of steps:

(a) reacting by contacting an acid-activated siliceous surface with $SiCl_4$, thereby causing substantial chlorosilylation of said surface,

(b) reacting by contacting the chlorosilylated surface with water vapor until essentially all of the chlorosilyl groups have been hydrolyzed to hydroxysilyl groups,

(c) reacting by contacting the hydrolyzed surface with excess dichlorosilane of the formula $RR'SiCl_2$ wherein R and R' each represent a methyl, ethyl, or vinyl radical for a time sufficient to react at least the major proportion of the hydroxysilyl groups to form corresponding disubstituted chlorosilyl groups,

(d) reacting by contacting the reacted product of (c) with water vapor until essentially all of the disubstituted chlorosilyl groups have been hydrolyzed to corresponding disubstituted hydroxysilyl groups,

(e) reacting by contacting the hydrolyzed product of (d) with $SiCl_4$ for a time sufficient to react substantially all of said disubstituted hydroxysilyl groups to form silyloxy chlorosilyl groups, and

(f) reacting by contacting the chlorosilylated product of (e) with a molar excess over said silyloxy chlorosilyl groups of a siloxane polymer polyol in the liquid state, said polyol having a molecular weight of at least about 230 and having a molecular structure consisting essentially of repeating units of the formula

thereby reacting essentially all of said silyloxy chlorosilyl groups with said polyol to form pendant polyol residues having at least one terminal hydroxyl group per residue.

4,242,228
CATALYSTS FOR CONVERSION OF CONJUGATED DIOLEFINS TO DIACYLOXY OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 827,631, Aug. 25, 1977, Pat. No. 4,180,676. This application Jan. 31, 1979, Ser. No. 8,150
Int. Cl.² B01J *31/02, 31/04, 27/08, 27/06*
U.S. Cl. 252—429 R **20 Claims**

1. The composition consisting essentially of catalytically effective ratios to convert conjugated dienes to diacyloxy olefins of (A) a uranium compound, (B) an alkali metal ion, (C) a halide which is chloride, bromide, or iodide, and at least one of (D) a dihalobutene and (E) carboxylic acid media; wherein said (C) halide is supplied from the group consisting of said (A) uranium compound, an alkali metal compound supplying said (B) alkali metal ion, and alkaline earth metal halides.

4,242,229
SOLID CATALYST COMPONENTS FOR POLYMERIZATION OF α-OLEFINS

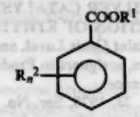
Masaki Fujii; Shiro Goto, and Hideo Sakurai, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,675
Claims priority, application Japan, Apr. 6, 1978, 53/40544
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **11 Claims**

1. A solid catalyst component for forming, in combination with an organoaluminum compound, a catalyst for polymerization of α-olefins, which solid catalyst component is a product of contact of materials consisting essentially of:

(1) a, magnesium halide

(2) a benzoate ester, of the formula



wherein, R^1 denotes a saturated hydrocarbon residue having 1 to 8 carbon atoms; R^2 is selected from the group consisting of hydrogen, a saturated hydrocarbon residue having 1 to 6 carbon atoms, an R^3O group, wherein R^3 is a saturated hydrocarbon residue having 1 to 6 carbon atoms, nitro group, and a halogen and n is 1 or 2, and

(3) a titanium halogen compound, and satisfies the conditions:

(A) that the titanium content in the solid catalyst component is such that the content of titanium atoms in % by weight on the basis of the weight of the solid component is in the range of 0.5 to 3.5% by weight, and

(B) that in the infrared absorption spectrum of the solid catalyst component, the highest absorption peak among the absorption peaks appearing in the wave-number region of 1560 cm^{-1} to 1710 cm^{-1} appears in the wave-number region of 1665 cm^{-1} to 1710 cm^{-1}.

4,242,230

CATALYST COMPONENT FOR USE IN THE POLYMERIZATION OF α-OLEFINS AND A METHOD OF USING THE SAME

Hiroshi Ueno, Namekawa; Masafumi Imai; Naomi Inaba, both of Ooi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1979, Ser. No. 29,081

Claims priority, application Japan, Apr. 12, 1978, 53-42147

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **21 Claims**

1. A supported titanium catalyst adaptable for use in stereoregular polymerization of α-olefins, produced by a process comprising:

cogrinding, in combination, a magnesium halide, a tetravalent titanium halide, and a carboxylic acid ester to obtain a titanium-containing solid product;

treating said titanium-containing solid product by contacting at a temperature in the range of from about 40° C. to about 200° C. for about 0.5 to about 20 hours with a compound selected from one of a hydrocarbon which can be present in an amount of from 5 to 50 times the weight of the titanium-containing solid, an organo halogen compound which can be one of a halogen substituted aliphatic, alicyclic and aromatic hydrocarbons having from 1 to 20 carbon atoms and can be present in an amount of from 0.5 to 50 times the weight of the titanium-containing solid, and mixtures thereof; and

recovering the resulting treated solid product as said supported titanium catalyst.

4,242,231

CATALYST COMPONENT FOR USE IN THE POLYMERIZATION OF α-OLEFINS AND A METHOD OF USING THE SAME

Hiroshi Ueno, Namekawa; Masafumi Imai; Naomi Inaba, both of Ooi; Makoto Yoda, Kawagoi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1979, Ser. No. 29,083

Claims priority, application Japan, Apr. 12, 1978, 53-42148

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **12 Claims**

1. A supported titanium catalyst adaptable for use in stereoregular polymerization of α-olefins, produced by a process comprising:

cogrinding, in combination, a magnesium halide, a tetravalent titanium halide in the amount of from about 0.1 to about 10% by weight as supported titanium metal in the resulting titanium-containing solid product, from about 0.1 to about 10 mols per 1 gram atom of supported titanium metal of an ester of a saturated or unsaturated aliphatic, alicyclic and aromatic mono- or polycarboxylic acid and an aliphatic, alicyclic and araliphatic mono- or polyols and an organo halogen compound in a proportion of 1 to 100% by weight to the magnesium halide, said organo halogen compound being one of mono- and polyhalo-substituted aliphatic or alicyclic hydrocarbons having from 1 to 20 carbon atoms; and

recovering the resulting titanium solid product as said supported titanium catalyst, wherein the intensity of the X-ray diffraction peak at 14.8° is dull and the intensity of the 30.2° peak is reduced compared to the characteristic X-ray diffraction lines of normal magnesium halide.

4,242,232

CATALYST AND ITS PREPARATION AND USE FOR THE SOLUTION POLYMERIZATION OF CONJUGATED DIENES

Gerd Sylvester, Leverkusen; Josef Witte, and Günter Marwede, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,632

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1978, 2830080

Int. Cl.³ C08F *4/12*

U.S. Cl. 252—429 C **13 Claims**

1. A catalyst comprising

(A) a reaction mixture formed by reacting a rare earth carboxylate, $M(RCO_2)_3$, with an aluminum trialkyl, $AlR^1{}_3$,

(B) an aluminum trialkyl, $AlR^2{}_3$, and/or an alkylaluminumhydride and

(C) a Lewis acid selected from the group consisting of an organometallic halide whose metal is of main group 3a and 4a of the Periodic System and a halide of an element of main group 3a, 4a and 5a of the Periodic System,

wherein

M denotes a trivalent rare earth element with an atomic number of 57 to 71,

R denotes a saturated or unsaturated, straight chain or branched chain aliphatic hydrocarbon group having 1 to 20 C-atoms which may be substituted one or more times with cycloalkyl having 5 to 7 C-atoms and/or phenyl, the carboxyl group being attached to a primary, secondary or tertiary C-atom; a cycloalkyl group having 5 to 7 ring carbon atoms, which may be substituted one or more times with alkyl groups having from 1 to 5 C-atoms; or an aromatic group having from 6 to 10 ring carbon atoms, which may be substituted one or more times with alkyl groups hav 1 to 5 C-atoms, and

R^1 and R^2 are identical or different, straight chain or branched chain alkyl groups having from 1 to 10 C-atoms.

4,242,233

METHOD FOR PREPARING ALUMINOSILICATES, THEIR USE AS CATALYST SUPPORTS AND CATALYSTS, AND METHOD FOR PRODUCING CATALYSTS THEREFROM

William J. Ball, Capel; Keith W. Palmer, Weybridge, and David G. Stewart, Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 11, 1978, Ser. No. 968,401

Claims priority, application United Kingdom, Dec. 23, 1977, 53645/77

Int. Cl.[3] C01B *33/28;* B01J *29/06*

U.S. Cl. 252—431 N 9 Claims

1. A method for preparing a crystalline aluminosilicate which method comprises mixing a source of silica, a source of alumina, a source of alkali metal, water and at least one monoalkanolamine selected from the group consisting of monoethanolamine and mono-propanolamine, said source of silica to said source of alumina being in the range of from 10:1 to 150:1 based on the equivalent moles of silica and alumina in the respective sources, and maintaining the mixture at a temperature in the range of from about 80° to 210° C. and a pressure in the range from about 70 to 400 psig for a time greater than four hours.

7. A method as defined in claim 1 wherein the aluminosilicate obtained is impregnated with a compound of one or more metals selected from the group consisting of copper, silver, zinc, gallium, indium, thallium, lead, antimony, bismuth, iron, cobalt, nickel, ruthenium, rhodium, palladium, iridium, and platinum.

4,242,234

CATALYST FOR CONVERSION OF HYDROGEN AND CARBON MONOXIDE INTO C_1–C_4 RANGE HYDROCARBONS

Warren G. Schlinger, Pasadena, and William L. Slater, LaHabra, both of Calif., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 865,764, Dec. 29, 1977. This application Jan. 26, 1979, Ser. No. 6,835

Int. Cl.[3] B01J *23/78, 27/04*

U.S. Cl. 252—439 2 Claims

1. An ebullient bed catalyst for producing from the product gas from the partial oxidation of hydrocarbon and/or carbonaceous materials light hydrocarbon gases containing an increased yield of C_1 to C_4 range saturated hydrocarbons essentially comprising: iron oxide selected from the group consisting of mill scale, magnetite, and mixtures thereof ground to an average particle size in the range of from about 350 to 800 microns, magnetically separated from extraneous matter, treated with an aqueous solution of potassium carbonate in an amount sufficient to deposit upon said ground iron oxide about 2–10 pounds potassium carbonate per 1000 pounds of iron oxide, dried, chemically reduced with hydrogen at a temperature in the range of about 650°–800° F. and a pressure in the range of about 100 to 1000 psig until evolution of water ceases, and then sulfided at an elevated temperature in the range of about 200°–900° F. with a sulfur-containing compound capable of sulfiding said catalyst such that said reduced iron catalyst contains from about 0.01 to about 1.0 weight percent sulfur.

4,242,235

SUPPORTS FOR SILVER CATALYSTS UTILIZED IN THE PRODUCTION OF ETHYLENE OXIDE

Jean-Marie Cognion, Saint Genis Laval, and Jacques Kervennal, Lyons, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 23, 1978, Ser. No. 953,940

Claims priority, application France, Dec. 22, 1977, 77 38744

Int. Cl.[3] B01J *21/12, 21/04, 23/50*

U.S. Cl. 252—455 R 13 Claims

1. A process for the preparation of a supported silver catalyst suitable for the production of ethylene oxide comprising:

(a) impregnating a porous refractory support material comprising:

(1) a specific surface area of less than about 10 m^2/g,

(2) a total porosity volume of between about 0.1 and 0.6 cm^3/g, and

(3) a substantially bimodal porosity distribution in which:

(a) the smaller pores have a mean diameter of about 1–5μ,

(b) the smaller pores constitute about 35–65% of the pore volume, and

(c) the larger pores have a mean diameter of about 60–200μ,

with a liquid containing a compound or complex of silver,

(b) drying the impregnated support, and

(c) thermally treating the dried support to liberate the silver from the compound or complex deposited on the support.

3. The process of claim 1 wherein the support is selected from alumin or silica-alumina.

4,242,236

65-130 ANGSTROM MEAN RADIUS SILICA-ALUMINA CATALYST SUPPORT

Donald W. Blakely, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1979, Ser. No. 25,222

Int. Cl.[3] B01J *21/12*

U.S. Cl. 252—455 R 1 Claim

1. A catalyst support comprised of alumina and silica having a mean pore radius ranging from about 65 to about 130 Angstroms; a total pore volume from about 0.75 to about 1.3 ml/g; and a total surface area ranging from about 150 to 300 m^2/g.

4,242,237

HYDROCARBON CRACKING CATALYST AND PROCESS UTILIZING THE SAME

Elroy M. Gladrow, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 31, 1979, Ser. No. 44,360

Int. Cl.[3] B01J *29/08, 29/18*

U.S. Cl. 252—455 Z 11 Claims

1. A catalyst comprising:

(a) an ultrastable Y-type crystalline aluminosilicate zeolite having less than about 1 weight percent rare earth metals, calculated as the elemental metal, based on the zeolite;

(b) a small pore crystalline aluminosilicate zeolite selected from the group consisting of erionite, mordenite, zeolite A, chabazite and offretite; and

(c) a catalytic inorganic oxide matrix.

4,242,238

SYNTHESIS OF PEPTIDES

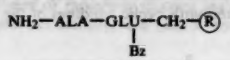
Robert L. Colescott, Bourbonnais; Emil Kaiser, Chicago, and Charles D. Bossinger, Olympia Fields, all of Ill., assignors to Armour and Company, Phoenix, Ariz.

Filed Feb. 13, 1976, Ser. No. 657,753

Int. Cl.[3] C08L *37/00;* C07C *103/52;* A61K *37/00*

U.S. Cl. 260—8 6 Claims

1. A resin peptide having the structure:



where Ⓡ is divinylbenzene crosslinked polystyrene resin and Bz is benzyl, p-methoxylbenzyl, p-chlorobenzyl, p-nitrobenzyl or benzhydryl.

4,242,239

BONDABLE AGAR DENTAL IMPRESSION MATERIAL

Henry A. Kessler, Succasunna, and Richard A. McEvoy, Lincoln Park, both of N.J., assignors to Warner-Lambert, Morris Plains, N.J.

Filed Jun. 11, 1979, Ser. No. 47,432
Int. Cl.³ C08L 5/12
U.S. Cl. 260—9 4 Claims

1. In an improved agar-agar dental impression material, the improvement comprises the inclusion of a small amount of a poly(ethylene oxide) polymer having a molecular weight of about 100,000 to about 5,000,000.

4,242,240

COMPOSITIONS INTENDED FOR THE FLAMEPROOFING OF PLASTICS

Jacqueline Cerny, and Gilbert Vivant, both of Lyons, France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 690,842, May 28, 1976, abandoned.
This application Mar. 23, 1978, Ser. No. 889,337
Claims priority, application France, Mar. 19, 1976, 76 08607
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.² C08L 1/10
U.S. Cl. 260—14 3 Claims

1. Compositions intended for the flameproofing of plastics, which do not evolve toxic products during the processing of these plastics, characterized in that they contain:

(a) from 50 to 95% by weight of red phosphorus in the form of a powder having a mean particle size of less than 200μ;

(b) from 5 to 50% by weight of a thermoplastic phenol-formaldehyde polycondensate of molecular weight between 120 and 1,500, wherein the molar ratio of formaldehyde to phenol is between 0.7 and 0.9 and in which the particles of red phosphorus are coated with the polycondensate.

4,242,241

METHOD FOR MAKING A SLURRY CONTAINING PARTICULATE MATTER AND FIBERS FOR A PREFORMED INSULATION PRODUCT

Murray Rosen; Alan R. Koenig, both of St. Petersburg, and John D. Copham, Seminole, all of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 847,165, Oct. 31, 1977, Pat. No. 4,168,919.
This application Jan. 29, 1979, Ser. No. 7,101
Int. Cl.³ C08L 1/00, 3/00
U.S. Cl. 260—17.2 3 Claims

1. A method of making a preformed insulation product from a slurry containing particulate matter, binder and fibers comprising making a liquid binder, putting chopped strands of fibers into said liquid binder, agitating said liquid binder to separate at least some of said strands into individual fibers, forcing said liquid binder and fibers under pressure through a hollow tubular member against an inwardly closing helical vane to form a conically expanding spray of binder and fibers, breaking up any remaining strands of fibers into individual fibers, forming a falling curtain of separated particulate matter and directing said conically expanding spray of binder and fibers against said falling curtain of separated particulate matter to form a uniform slurry of particles, binder and fibers, putting said slurry into molds and heating said molds to a temperature and for a sufficient period of time to make a preformed insulation product.

4,242,242

HIGHLY ABSORBENT FIBERS OF RAYON WITH SULFONIC ACID POLYMER INCORPORATED

Thomas C. Allen, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Jun. 10, 1977, Ser. No. 805,361
Int. Cl.³ C08L 1/02
U.S. Cl. 260—17.4 CL 29 Claims

1. A highly absorbent cellulosic fiber containing in a physical admixture with cellulose at least about 2% by weight based on the weight of the cellulose of a homopolymer consisting essentially of polymerized 2-acrylamido-2-methylpropane sulfonic acid monomers or the partial or complete alkali metal or ammonium salts thereof.

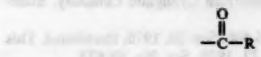
4,242,243

HIGH SOLIDS AMBIENT TEMPERATURE CURING COATINGS OF ACRYLIC-FATTY ACID DRYING OIL RESINS

Joseph A. Antonelli, Riverton, N.J.; Renee J. Kelly, Media, and Joseph E. McLaughlin, Philadelphia, both of Pa., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jul. 18, 1979, Ser. No. 58,662
Int. Cl.³ C08L 25/14, 33/12
U.S. Cl. 260—23 AR 29 Claims

1. A high solids coating composition comprising a polymer having a backbone of polymerized monomers selected from the group consisting of an alkyl methacrylate, an alkyl acrylate, styrene or mixtures thereof and polymerized hydroxyl containing monomers selected from the group consisting of a hydroxy alkyl acrylate, a hydroxy alkyl methacrylate of mixtures thereof, wherein the active hydrogen of at least one pendant hydroxyl group of the backbone is replaced by



where R is the residual of a drying oil fatty acid and wherein the polymer has a glass transition temperature of at least 20° C.

4,242,244

RESINS FOR PRINTING INKS

Alberto Malatesta, Brussels, Belgium, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 19, 1979, Ser. No. 22,080
Claims priority, application United Kingdom, Mar. 22, 1978, 11407/78; Oct. 24, 1978, 41740/78
Int. Cl.³ C08F 279/02; C09D 3/733, 11/10
U.S. Cl. 260—23.7 C 20 Claims

1. A carboxyl modified metal-free petroleum resin comprising a resin obtained by thermal polymerisation of a feed containing cyclopentadiene and/or methylcyclopentadiene and/or the dimers or codimers thereof having been reacted electrophilically with a saturated or ethylenically unsaturated C_7 or higher fatt. cid, said modified resin having an acid number less than 20, containing from 1 wt.% to 5 wt.% of oxygen and having a softening point of from 120° C. to 200° C.

4,242,245

RUBBERY POLYMER SEALANT COMPOSITIONS

George M. Allison, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 6, 1979, Ser. No. 27,686
Int. Cl.³ C08K 3/10
U.S. Cl. 260—27 BB 15 Claims

1. A sealant composition comprising:

100 parts by weight of a rubbery polymer ingredient that does not contain any oxygenated functional groups,
25–200 parts by weight of modifying resin that is compatiable with said rubbery polymer,
25 to 300 parts by weight of a plasticizer,
100–2000 parts by weight of barium sulfate, and
1–20 parts by weight of a compound containing at least two acidic hydrogens that are attached to oxygen atoms wherein said compound is selected from the group consisting of substituted phenols, glycols and polyols.

4,242,246

PROCESS FOR THE PREPARATION OF BITUMINOUS COMPOSITIONS MAKING USE OF A MOTHER SOLUTION CONTAINING POLYMERS AND SULFUR

Paul Maldonado, St. Symphorien d'Ozon; Henri Dayre, Vienne, and Germain Hagenbach, Vernaison, all of France, assignors to Elf Union, Paris, France

Filed Jun. 13, 1979, Ser. No. 48,035
Claims priority, application France, Jun. 21, 1978, 78 18534
Int. Cl.³ C08L *91/00*
U.S. Cl. 260—28.5 AS **12 Claims**

1. A process for the preparation of a fluid bitumen-polymer composition which comprises: contacting, at a temperature of from 130° C. to 230° C., 85 to 95% by weight of a bitumen having a penetration of from 20 to 220 and 5 to 15% by weight of a second composition prepared by mixing a polystyrene-polydiene disequenced, multisequenced or statistical copolymer with a coal tar oil or a petroleum fraction having a distilling range at atmospheric pressure of about 100° to 350° C. and sulfur not chemically bonded and stirring the mixture of bitumen and said second composition for at least fifteen minutes.

4,242,247

PROCESS FOR WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE POLYMERS

Joseph J. Pellon, New Canaan, Conn., and Paul D. Savoy, Meterie, La., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 946,686, Sep. 28, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 69,673
Int. Cl.³ C08K *3/30*
U.S. Cl. 260—29.6 WQ **10 Claims**

1. A process for preparing a water-soluble polymer or copolymer of nonionic or anionic character which comprises preparing an aqueous solution of at least one water-soluble monomer, said aqueous solution containing dissolved therein from about 2 weight percent up to the solubility limit in water of a water-soluble, oil-insoluble added salt selected from the group consisting of sodium sulfate, sodium chloride, ammonium chloride, ammonium sulfate and sodium acetate, emulsifying the resulting monomer solution in a water-insoluble hydrocarbon oil to form a water-in-oil emulsion, and polymerizing said monomer in the dispersed phase to form the desired polymer.

4,242,248

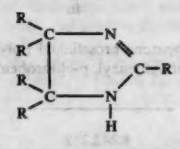
STORAGE-STABLE BAKING LACQUERS PREPARED FROM POLYISOCYANATES BLOCKED WITH CYCLIC AMIDINES

Rainer Gras, Herne; Johann Obendorf, Dorsten, and Elmar Wolf, Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Herne, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,625
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744782
Int. Cl.³ C08G *18/10*
U.S. Cl. 260—31.2 N **7 Claims**

1. Baking lacquers which are a blend of hydroxy-group-containing polymers, blocked polyisocyanates and organic solvents, which comprise:

a. 40 to 70 wt.% hydroxyl-group-containing polymers with hydroxyl numbers between 40 and 240 and polyisocyanates blocked with cyclic amidines of the formula:



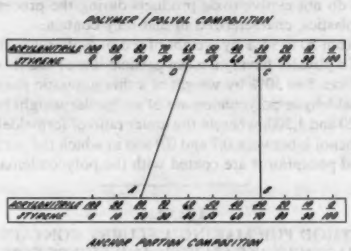
wherein R are equal or different substituents selected from the group consisting of hydrogen, alkyl-, cycloalkyl-, aralkyl- and aryl radicals whereby the components are used in such amounts that 0.8 to 1.2 NCO-group equivalents are applied for each hydroxyl group equivalent,
b. 0–2 wt.% cross-linking catalyst,
c. 30–60 wt.% of an organic solvent or solvent mixture whereby the percentages of polymer, catalyst and solvent add up to 100, as well as in addition:
d. 0–65 wt.% of pigments or fillers or mixtures thereof,
e. 0–5 wt.% colorants and, optionally
f. 0.1–3 wt.% flowing agents, gloss improvers, antioxidants or heat stabilizers or mixtures thereof.

4,242,249

POLYMER/POLYOLS VIA NON-AQUEOUS DISPERSION STABILIZERS

Russell Van Cleve; George H. Armstrong, and Donald W. Simroth, all of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 752,818, Dec. 20, 1976, abandoned. This application Apr. 3, 1979, Ser. No. 26,576
Int. Cl.³ C08K *5/06;* C08G *18/14, 18/63;* C07C *121/32*
U.S. Cl. 260—33.2 R **39 Claims**



1. A process for producing a fluid, stable polymer/polyol composition which comprises:

adding a preformed stabilizer, which is a graft or addition copolymer comprising (a) an anchor portion consisting essentially of a polymer or an ethylenically unsaturated monomer of a mixture of such monomers chemically bonded to (b) a solvatable portion consisting of a propylene oxide polymer having a number average molecular weight of at least about 800, said performed stabilizer having a viscosity in excess of 40,000 centipoises at 25° C., to a normally liquid polypropylene oxide polyol having a number average molecular weight of at least about 400 and a hydroxyl number of from about 20 to about 280, said preformed stabilizer being present in the polyol in an amount sufficient to stabilize a polymer particle dispersed therein against phase separation, in order to provide a homogeneous mixture of said preformed stabilizer and said polyol, and subsequently

polymerizing a reaction mixture comprising (I) said homogeneous mixture of preformed stabilizer and polyol, (II) from about 10 to about 40 weight percent of an ethylenically unsaturated monomer or a mixture of such mono-

mers, said weight percent being based on the total weight of the monomer or monomer mixture and the polyol in said homogeneous mixture, and (III) a free radical catalyst.

4,242,250

ORGANOPOLYSILOXANE RESINS FORMED WITH CATALYSTS OF FORMIC ACID AND HYDROCARBYL SUBSTITUTED AMMONIUM HYDROXIDE

Donald W. Gagnon, Sylvania, and James J. Tillman, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 25, 1979, Ser. No. 51,488
Int. Cl.³ C08K 5/05
U.S. Cl. 260—33.4 SB **32 Claims**

1. In a process for preparing an organopolysiloxane by hydrolyzing a trialkoxysilane in aqueous solution containing at least the stoichiometric amount of water required for said hydrolysis, condensing the hydrolyzed silane to an organopolysiloxane, and then cross-linking the oganopolysiloxane; the improvements comprising catalyzing at least some of said condensation by formic acid present in said solution at a strength greater than 700 ppm, and catalyzing cross-linking of said organopolysiloxane by a hydrocarbyl substituted ammonium hydroxide, said hydrocarbyl substituent being selected from alkyl, isoalkyl, and cycloalkyl up to about six carbon atoms, and from alkenyl, isoalkenyl, and cycloalkenyl up to about six carbon atoms.

4,242,251

COMPOSITION COMPRISING A THERMOPLASTIC RESIN AND MINERAL FILLER PARTICLES COATED WITH AN ETHYLENICALLY UNSATURATED ORGANIC ACID, THE ETHYLENIC DOUBLE BONDS OF WHICH REMAIN SUBSTANTIALLY UNREACTED; PRODUCT RESULTING FROM CAUSING SAID TO REACT

Itsuho Aishima, Fujisawa; Junji Seki, Tokyo; Koichi Matsumoto, Kurashiki; Yonemasa Furusawa, Amagasaki; Ryogo Tsukisaka, Takarazuka, and Yuhachi Takahashi, Amagasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka and Shiraishi Central Laboratories Co., Ltd., Hyogo, both of, Japan

Continuation-in-part of Ser. No. 923,885, Jul. 12, 1978, abandoned, which is a continuation of Ser. No. 867,260, Jan. 5, 1978, abandoned, which is a continuation of Ser. No. 581,460, May 28, 1975, abandoned. This application Jul. 26, 1979, Ser. No. 61,095
Claims priority, application Japan, May 28, 1974, 49-59377
Int. Cl.³ C08J 3/20; C08K 3/34, 9/04; C09C 1/40, 3/08
U.S. Cl. 260—37 N **23 Claims**

1. A composition comprising a thermoplastic resin and an activated mineral filler, said mineral filler consisting of particles of at least one aluminosilicate-type mineral containing alkali metal ions as cations in its crystal structure, the surfaces of said particles being covered monomolecularly with at least one ethylenically unsaturated organic acid selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, sorbic acid, maleic acid and itaconic acid, said unsaturated organic acid being bonded to the metal ions on the surfaces of said particles while retaining a substantial portion of the ethylenic double bonds unreacted.

18. A process for producing a compounded composition, which is characterized by mixing the activated mineral filler defined in claim 1 with a thermoplastic resin and heating the resulting mixture to react.

21. A process for producing a composition of claim 1 which comprises reacting particles of at least one aluminosilicate-type mineral containing alkali metal ions as cations in its crystal structure with at least one ethylenically unsaturated organic acid selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, sorbic acid, maleic acid and itaconic acid in the presence of an inhibitor, to prepare an activated mineral filler which has strong bonds between the unsaturated organic acid and the metal ions on the surface of said mineral paticles while retaining a substantial portion of the ethylenic double bonds unreacted, at a temperature of 50° to 200° C., and mixing said activated mineral filler with a thermoplastic resin.

4,242,252

PREPARATION OF ORGANOPOLYSILOXANE RESINS WITH WEAK ORGANIC BASES

Charles W. Newing, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 26, 1979, Ser. No. 23,928
Int. Cl.³ C08K 5/05
U.S. Cl. 260—33.4 SB **20 Claims**

1. In a process for preparing an organopolysiloxane by hydrolyzing a hydrolyzable silane in an aqueous solution containing at least the stoichiometric amount of water required for said hydrolysis and having an acid pH, and then condensing the hydrolyzed silane to the organopolysiloxane, the improvements comprising incorporating in said aqueous solution after hydrolysis of said silane and prior to complete condensation and polymerization of the organopolysiloxane to a solid state, a stabilizing amount against gelation of a weak organic base having an ionization constant in water no greater than about 1×10^{-7} at 25° C. to at least partially neutralize the acid of said water and provide improved stability to said organopolysiloxane against gelation.

19. A composition adapted for shaping into a desired form comprising a solution containing an organic solvent-soluble siloxane partial condensation product resulting from the process of claim 1, the amount of said siloxane condensation product not exceeding 90 weight percent of said solution, said condensation product being still soluble in ethanol after about two months at room temperature.

4,242,253

LOW GLOSS POWDER COATING COMPOSITIONS

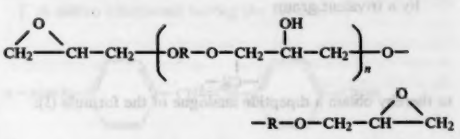
Michael D. Yallourakis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 4, 1979, Ser. No. 45,414
Int. Cl.³ C08K 3/26
U.S. Cl. 260—40 TN **10 Claims**

1. A thermosetting powder coating composition consisting essentially of finely-divided particles at least 90 percent by weight of which have a maximum particle size not exceeding 100 microns; wherein the particles comprise a blend of about

(a) 14–64% by weight of a polyester or a blend of polyesters of polyol and an aromatic polycarboxylic acid having a number of average molecular weight of about 1,000–10,000 determined by gel permeation chromatography;

(b) 5–18% by weight of an epoxy resin of the formula



where n is a positive integer and R is an aromatic radical;

(c) 0.1–3% by weight of triglycidyl isocyanurate;

(d) 30–55% by weight of calcium carbonate pigment and

(e) 0.9–10% by weight of finely divided polypropylene particles.

4,242,254

GLASS REINFORCEMENTS AND FIRE RETARDANT GLASS-RESIN COMPOSITES THEREFROM

Visvaldis Abolins, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 100,441, Dec. 21, 1970, abandoned. This application Sep. 28, 1976, Ser. No. 727,349

Int. Cl.[3] C08K *7/10, 9/04, 9/06*

U.S. Cl. 260—40 R 44 Claims

1. As a new composition of matter, a molding powder comprising particles of resin having dispersed therein a reinforcement comprising filamentous glass in which the filaments of said glass are uniformly coated with a non-burning or self-extinguishing polymerized sizing composition that consists essentially of a thermoplastic or thermosetting resin, a silane or chrome coupling agent and a flame retardant additive, said flame retardant additive being present in an amount that is sufficient to render the composition non-burning or self-extinguishing.

4,242,255

FIRE RETARDANT CURABLE ETHYLENICALLY UNSATURATED COMPOSITIONS

Klaas Ytsema, Dieren, and Cornelis D. W. Klos, Bennekom, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 4, 1979, Ser. No. 45,548

Claims priority, application Netherlands, Jun. 26, 1978, 7806831

Int. Cl.[3] C08K *5/56*

U.S. Cl. 260—45.75 P 14 Claims

1. A composition comprising a curable, ethylenically unsaturated compound containing ester linkages and an effective fire retardant amount of an organic iron compound selected from the group consisting of N,N'-ethylene bis(salicylidene iminato) Fe II, its oxidation product, and mixtures thereof.

4,242,256

SYNTHESIS OF PEPTIDE ANALOGUES

Robert Sharpe, 64 Cleveland Rd., Ealing, London W13, and Michael Szelke, 10 North Dr., Ruislip, Middlesex, both of England

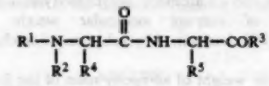
Continuation of Ser. No. 886,789, Mar. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 780,436, Mar. 23, 1977, abandoned. This application Jun. 29, 1979, Ser. No. 53,519

Claims priority, application United Kingdom, Mar. 15, 1977, 13192/76

Int. Cl.[3] C07C *103/52;* C07D *207/24;* C07C *147/02, 101/30*

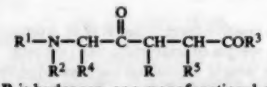
U.S. Cl. 260—112.5 R 19 Claims

1. A method for isosterically replacing the nitrogen atom of the linking amide group of a dipeptide of the formula:



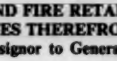
by a trivalent group

to thereby obtain a dipeptide analogue of the formula (I):

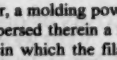


(I)

wherein R is hydrogen, or a monofunctional organic group, or a bond to the group —CH(R^5)— forming a cyclic group



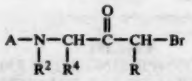
NR^1R^2 is an amino group, or an imino group or derivative thereof, bonded to the group —CH(R^4)— forming a cyclic group



COR^3 is a carboxyl group or a derivative thereof, R^4 and R^5 are the same or different side chain residues of an α-amino aicd, or R^4 is a divalent group bonded to the group R^1R^2N—, or R^5 is a divalent organic group bonded to the group

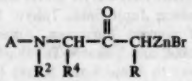
which comprises:

reacting a ketone of the formula (II):



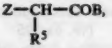
(II)

wherein A is an amine-protecting group, with zinc, to obtain a compound of formula (III):



(III)

reacting the compound of formula (III) with a compound of the formula



wherein Z is a group capable of acting as a leaving group in a nucleophilic substitution reaction, and B is a carboxy-protecting group to obtain a compound of the formula $ANR^2—CHR^4—COCHRCHR^5—COB$;

removing the amine- and carboxy-protecting groups if necessary, thereby obtaining a compound of the formula (I).

4,242,257

PROCESS FOR OBTAINING A NEW GLUCOSE TOLERANCE FACTOR

Fernando Silio, Breton de los Herreros, 59 1° D, Madrid, Spain

Filed Jul. 3, 1979, Ser. No. 54,535

Claims priority, application Spain, Jul. 26, 1978, 472.034

Int. Cl.[3] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R 7 Claims

1. A process for obtaining a glucose tolerance factor, wherein a cobaltous salt in water is neutralized by adding an alkali, nicotinamide is added on neutralization of the cobaltous salt, the formed complex of cobalt and nicotinamide in a ratio of 1:2 is after acidification to a pH of between 4.5 and 6.5 reacted with reduced glutathione and said glucose tolerance factor is obtained.

4,242,258

WATER-SOLUBLE DYESTUFFS, PROCESSES FOR THEIR MANUFACTURE, THEIR USE AS FIBER-REACTIVE DYESTUFFS FOR DYEING AND PRINTING FIBER MATERIALS AND THE FIBER MATERIALS DYED WITH THESE DYESTUFFS

Walter Noll, Bad Soden am Taunus; Fritz Meininger, and Ernst Hoyer, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

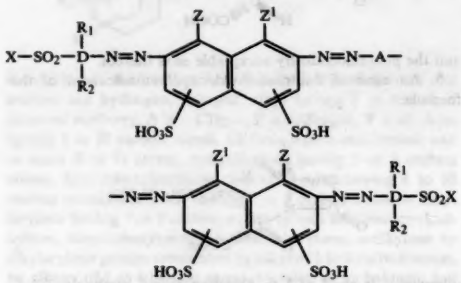
Filed Feb. 21, 1979, Ser. No. 13,308

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1978, 2807260

Int. Cl.³ C09B *31/30, 33/00, 35/00*

U.S. Cl. 260—152 2 Claims

2. A water-soluble dyestuff which, in the form of the free acid, has the formula



in which

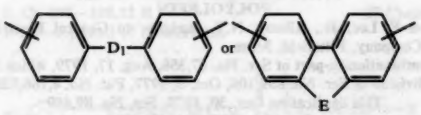
D is a benzene or naphthalene nucleus;

R_1 is in the ortho-position relative to the azo group and is hydrogen, halogen, lower alkyl, lower alkoxy, carboxy or sulfo;

R_2 is hydrogen, halogen, lower alkyl, lower alkoxy or sulfo, R_1 and R_2 being identical or different from one another;

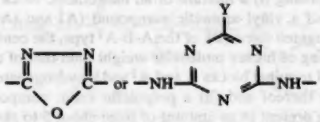
X is β-thiosulfatoethyl, β-chloroethyl, β-sulfatoethyl or vinyl;

A is



in which the benzene nuclei may be substituted by one or more members of the group consisting of lower alkyl, lower alkoxy, sulfo, carboxy, nitro and chlorine;

D_1 is a direct covalent bond or a bridge member of the formula $-CH_2-$, $-CH_2CH_2-$, $-CH=CH-$, $-NH-$, $-SO_2-$, $-CONH-$, $-NHCO-$,



in which Y is Cl, F or Br;

E is —O—, —S—, —NH— or $-SO_2-$;

Z is $-(OH)_{n-1}$ or $-(NH_2)_{2-n}$;

Z^1 is $-(OH)_{2-n}$ or $-(NH_2)_{n-1}$; and n is the number 1 or 2.

4,242,259

ANTHRAQUINONE-AZO REACTIVE DYESTUFFS

Wolfgang Harms, Leverkusen; Klaus von Oertzen, Cologne, and Klaus Wunderlich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

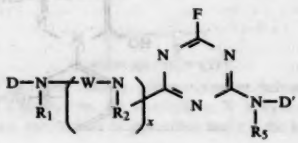
Filed Mar. 20, 1979, Ser. No. 22,294

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812634

Int. Cl.³ C09B *29/22*

U.S. Cl. 260—153 7 Claims

1. Dyestuffs of the formula



wherein

D = optionally substituted anthraquinonyl,

W = a bridge member,

R_1–R_3 = H or optionally substituted C_1–C_4-alkyl,

x = 0 or 1 and

D' = the radical of an azo dyestuff.

4,242,260

2-HYDROXY-3-CARBONYLANILINONAPHTH-1-YL DISAZO DERIVATIVES AND 1-PHENYL-3-METHYL-5-HYDROXYPYRAZOL-4-YL DISAZO DERIVATIVES OF 1,4-BIS(4-AMINOSTYRYL) BENZENE

Masaomi Sasaki, Kawasaki; Kiyoshi Sakai, Tokyo; Mitsuru Hashimoto, Hino; Masafumi Ohta, and Akio Kozima, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

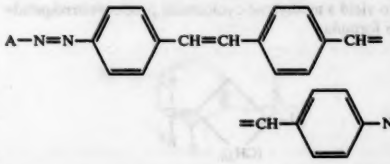
Division of Ser. No. 898,130, Apr. 20, 1978. This application Nov. 20, 1978, Ser. No. 961,963

Claims priority, application Japan, Apr. 27, 1977, 52-48859; Apr. 27, 1977, 52-48860

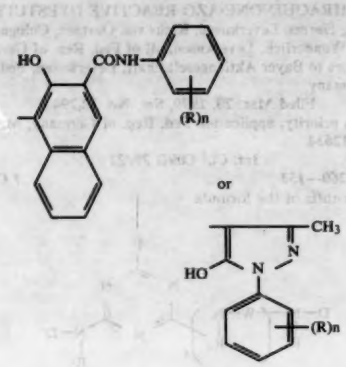
Int. Cl.³ C07C *107/04;* C09B *35/24;* G03C *5/54, 1/76*

U.S. Cl. 260—160 28 Claims

1. A disazo compound having the formula



wherein A is



and wherein R is alkyl, alkoxy, nitro, dialkylamino or halogen, n is 0 or an integer of 1, 2 or 3, and R may be either the same or different when n is 2 or 3.

4,242,261

PRODUCTION OF METHYLENE-CYCLOAMINES

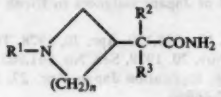
Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Filed Jul. 19, 1979, Ser. No. 59,092

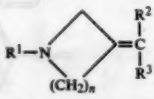
Int. Cl.³ C07D *205/06, 211/70, 207/20, 223/04*

U.S. Cl. 260—239 A **15 Claims**

1. A process for preparing methylene-cycloamine derivatives which comprises the steps of (1) reacting a substituted acetamide compound with bromine and alkali metal alkoxide to produce a carbamate intermediate, wherein said substituted acetamide starting material corresponds to the formula:



wherein R^1 is selected from lower-alkyl, phenyl-lower-alkyl and cycloalkyl radicals, R^2 and R^3 are selected from phenyl and lower-alkylphenyl radicals, and n is an integer between 1 and 4; and (2) heating said carbamate intermediate in an acidic medium to yield a methylene-cycloamine product corresponding to the formula:



wherein R^1, R^2, R^3 and n are as previously defined.

4,242,262

9-NITROMETHYLDEOXYCLAVULANIC ACID DERIVATIVES PREPARATION AND COMPOSITIONS

Irene Stirling, Reigate, England, assignor to Beecham Group Limited, England

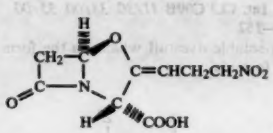
Filed Nov. 20, 1978, Ser. No. 962,329

Claims priority, application United Kingdom, Nov. 29, 1977, 49730/77

Int. Cl.³ C07D *498/04;* **A61K** *31/42*

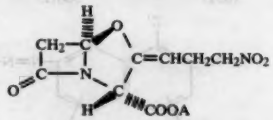
U.S. Cl. 260—245.3 **6 Claims**

1. A compound selected from the group consisting of 9-nitromethyldeoxyclavulanic acid of the formula:



and the pharmaceutically acceptable salts thereof.

5. An ester of 9-nitromethyldeoxyclavulanic acid of the formula:



wherein A is alykl of 1 to 6 carbon atoms, methoxymethyl, acetoxymethyl, acetoxyethyl, phthalidyl, ethoxycarbonyloxymethyl, α-ethoxycarbonyloxyethyl, benzyl, nitrobenzyl, chlorobenzyl, methoxybenzyl or bromobenzyl.

4,242,263

COMPOSITION OF A POLYPHENYLENE ETHER, A BLOCK COPOLYMER OF A VINYL AROMATIC COMPOUND AND A CONJUGATED DIENE AND A POLYOLEFIN

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 67,358, Aug. 17, 1979, which is a division of Ser. No. 839,106, Oct. 3, 1977, Pat. No. 4,166,055.

This application Oct. 30, 1979, Ser. No. 89,469

Int. Cl.³ C08K *5/49, 53/00*

U.S. Cl. 260—306 R **19 Claims**

1. A thermoplastic composition, having high impact strength, comprising

(a) a polyphenylene ether resin or a composition comprising a polyphenylene ether resin and a styrene homopolymer or random copolymer resin and

(b) a synergistic, impact strength-improving combination comprising (i) a mixture of an elastomeric block copolymer of a vinyl aromatic compound (A) and $(A)^1$ and a conjugated diene (B), of the A-B-A^1 type, the center block B being of higher molecular weight than that of the combined terminal blocks A and A^1 and a hydrogenated derivative thereof and (ii) a polyolefin resin, component (b) being present in an amount of from about 5 to about 30% by weight of the total resinous components of the composition.

17. A composition as defined in claim 1 including up to about 25% by weight of a plasticizer.

18. A composition as defined in claim 17 wherein said plasticizer is triphenyl phosphate.

4,242,264

TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

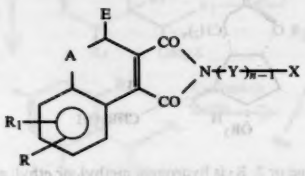
Filed Feb. 6, 1979, Ser. No. 9,985

Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.[3] C07D *209/90, 209/94*

U.S. Cl. 260—326 C 4 Claims

1. A compound of formula I



(I)

in which n is the number 2, R and R_1 independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, A is —CH_2—, E is hydrogen, Y is alkylene having 1 to 30 carbon atoms, alkylene which can contain one or more S or O atoms, cycloalkylene having 5 or 6 carbon atoms, dicyclohexylmethane radical, arylene having 6 to 10 carbon atoms, aralkylene having 7 or 8 carbon atoms or alkylarylene having 7 or 8 carbon atoms; or said alkylene, cycloalkylene, dicyclohexylmethane radical, arylene, aralkylene or alkylarylene groups substituted by alkyl of 1 to 4 carbon atoms, by alkoxy of 1 to 4 carbon atoms, by nitro or by halogen, and X is —OCO-alkenyl having 2 to 4 carbon atoms in the alkenyl moiety.

4,242,265

INDOLYLALKYL ESTERS OF MERCAPTOALKANOIC ACIDS

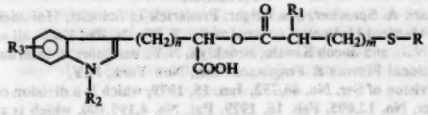
Peter C. Wade, Pennington, and Miguel A. Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 815,472, Jul. 14, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,430

Int. Cl.[3] A61K *31/405;* C07D *209/12*

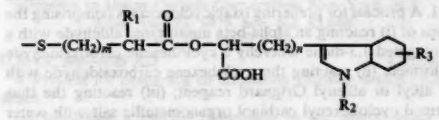
U.S. Cl. 260—326.12 R 17 Claims

1. A compound of the formula



wherein

R is hydrogen, lower alkanoyl, benzoyl or



R_1 is hydrogen, lower alkyl or phenyl-lower alkyl;

R_2 is hydrogen or lower alkyl;

R_3 is hydrogen, halogen, hydroxy, nitro, lower alkoxy or lower alkylthio;

m and n each is 0, 1, 2 or 3 and pharmaceutically acceptable basic salts thereof.

4,242,266

1-BENZOTHIEPIN-4-CARBOXYLIC ACID DERIVATIVES

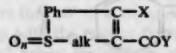
Melvin H. Rosen, Madison, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 763,192, Jan. 27, 1977, Pat. No. 4,166,126, which is a continuation of Ser. No. 585,147, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,524, Sep. 26, 1974, abandoned. This application Aug. 29, 1978, Ser. No. 937,633

Int. Cl.[3] C07D *409/04, 337/08*

U.S. Cl. 260—326.34 2 Claims

1. A 2,3-dihydro-1-benzothiepin-4-carboxylic acid ester, anhydride or halide of the formula



wherein Y is lower alkoxy, alkanoyloxy or halogeno, Ph is 4-chloro-1,2-phenylene, alk is ethylene, X is hydroxy, lower alkanoyloxy, pyrrolidino or piperidino and n is the integer one.

4,242,267

PROCESS FOR PREPARING 5-ALKYL-7-(S-ALKYL-SULFONIMIDOYL)-XANTHONE-2-CARBOXYLIC ACIDS

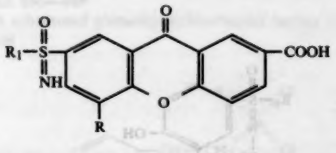
Alan C. Barnes, Cirencester, and Peter D. Kennewell, Swindon, both of England, assignors to Roussel Uclaf, Paris, France

Filed Feb. 4, 1980, Ser. No. 118,523

Int. Cl.[3] C07D *311/86*

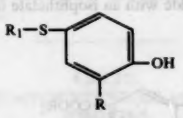
U.S. Cl. 260—335 5 Claims

1. A process for the preparation of a compound of the formula



I

wherein R is selected from the group consisting of hydrogen and alkyl of 1 to 9 carbon atoms and R_1 is alkyl of 1 to 5 carbon atoms comprising reacting a phenol of the formula

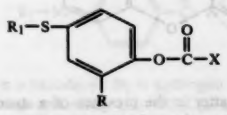


II

wherein R and R_1 have the above definitions with an acyl halide or anhydride of the formula

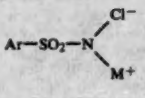
Hal—COX or $(XCO)_2O$

wherein Hal is selected from the group consisting of chlorine and bromine and X is selected from the group consisting of alkyl of 1 to 3 carbon atoms and phenyl to obtain a compound of the formula

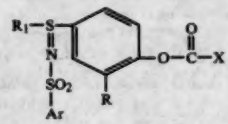


III

reacting the latter with a compound of the formula

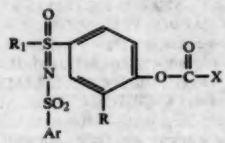


wherein Ar is an optionally substituted aryl and M is an alkali metal to obtain a compound of the formula



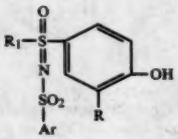
IV

oxidizing the latter to obtain a compound of the formula



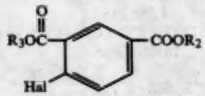
V

subjecting the latter to hydrolysis to obtain a compound of the formula



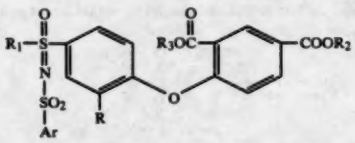
VI

reacting the latter in the presence of a weak base and metallic copper or copper oxide with an isophthalate of the formula



VII

wherein R_2 and R_3 are individual ester groups and Hal is chlorine, bromine or iodine to obtain a compound of the formula



VIII

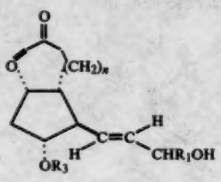
and cyclizing the latter in the presence of a strong acid followed by hydrolysis to obtain the corresponding compound of claim 1.

4,242,268
BICYCLIC LACTONES

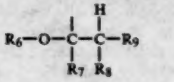
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 654,109, Feb. 2, 1976, abandoned. This application Nov. 23, 1979, Ser. No. 96,645
Int. Cl.[3] C07D 307/77
U.S. Cl. 260—343.3 P 2 Claims

1. A compound of the formula



wherein n is one or 2; R_1 is hydrogen, methyl, or ethyl; and R_3 is a blocking group which is tetrahydropyranyl, tetrahydrofuranyl, or a group of the formula



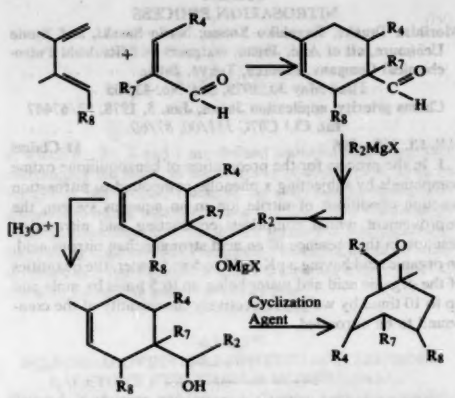
wherein R_6 is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_7 and R_8 are the same or different, being hydrogen, alkyl of one to 4 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or, when R_7 and R_8 are taken together, $-(CH_2)a-$ or $-(CH_2)b-O-(CH_2)c-$ wherein a is 3, 4, or 5, b is one, 2, or 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, and wherein R_9 is hydrogen or phenyl.

4,242,269
2-OXABICYCLOOCTANE DERIVATIVES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 48,752, Jun. 15, 1979, which is a division of Ser. No. 12,695, Feb. 16, 1979, Pat. No. 4,195,100, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Nov. 16, 1979, Ser. No. 95,147
Int. Cl.[3] C07D 309/04
U.S. Cl. 260—345.1 1 Claim

1. A process for preparing oxabicyclooctanes comprising the steps of (i) reacting an alpha-beta unsaturated aldehyde with a conjugated 1,3-diene whereby a cyclohexene carboxaldehyde is formed: (ii) reacting the cyclohexene carboxaldehyde with an alkyl or alkenyl Grignard reagent; (iii) reacting the thus formed cyclohexenyl carbinol organometallic salt with water in the presence of a protonic acid to form the cyclohexenyl carbinol; (iv) cyclizing the resulting cyclohexenyl carbinol to form the oxabicycloctane in the presence of a cyclizing agent, said cyclization reaction taking place at a temperature in the range of from 25° C. up to 150° C. in the presence of a protonic acid or a Lewis acid, and in the presence of an organic solvent miscible therewith, according to the reaction sequence:



wherein R_2 is C_2–C_5 alkyl; R_4 is hydrogen, methyl or ethyl, R_7 is hydrogen or methyl; and R_8 is hydrogen or methyl with the proviso that when R_4 is methyl or ethyl, R_7 and R_8 are not both hydrogen and that at least one of R_7 and R_8 is methyl; X is chloro, bromo or iodo.

4,242,270

PROCESS FOR SEPARATING LIPIDS FROM ENDOTOXINS

Gerard Ayme, Lyon, and Ladislas Szabo, Verrieres-le-Buisson, both of France, assignors to Institut Merieux, Lyons, France

Filed May 30, 1978, Ser. No. 910,895

Claims priority, application France, May 31, 1977, 77 16473

Int. Cl.³ C11B 1/10; C09F 5/10

U.S. Cl. 260—412.8 **11 Claims**

1. A process for separating the lipid fractions constituting a bacterial endotoxin such as Bordetella Pertussis endotoxin, comprising

(a) under mild conditions, hydrolyzing the endotoxin with an organic acid at a pH of from 2 to 4 to produce a mixture of a supernatant and a residue;

(b) separating the supernatant from the residue and lyophilizing the residue to yield a product denoted as product A;

(c) extracting product A with 1:1 toluene/methanol mixture which results in a supernatant containing an extract denoted as product X and an insoluble residue denoted as product B; and

(d) then extracting product X with a solvent different from the solvent mixture used in step (c) which results in a supernatant and an insoluble residue, wherein said residue is denoted as product X_2 and wherein the supernatant of step (d) contains an extract denoted as product X_1.

4,242,271

PROCESS FOR PREPARING ALUMINUM ALKOXIDES

Willis W. Weber, South Salem; Richard F. Hill, Cold Spring, both of N.Y., and Thomas J. Weeks, Jr., Columbus, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,640

Int. Cl.³ C07F 5/06

U.S. Cl. 260—448 AD **4 Claims**

1. Process for preparing an aluminum alkoxide which comprises

(a) providing a reactor containing in the liquid phase a monohydric alcohol containing from 1 to 10 carbon atoms, at a temperature of from 15° C. to 231° C.;

(b) introducing impure metallic aluminum from an air environment into the lower portion of said reactor and below the surface level of the alcohol therein by passing said impure aluminum downwardly through a feed column of said alcohol in the liquid phase at a temperature of not greater than 40° C. whereby any entrained air entering said feed column is returned to the atmosphere in the form of bubbles, said downward passage of the aluminum through said alcohol being sufficiently rapid that reaction between the aluminum and the alcohol is not initiated;

(c) conveying the impure aluminum upward through the alcohol in the reactor while reacting the aluminum value thereof with the said alcohol thereby forming hydrogen as a reaction by-product, colloidal particles of the impurity constituent of the impure aluminum, and a residue of sludge comprising the bulk of the said impurity constituent;

(d) conveying the sludge residue out of said reactor upwardly through a conduit containing alcohol at a temperature of not more than 40° C. at its egress end, said conduit communicating with the reactor through an orifice connection located below the surface of the liquid in the reactor; and

(e) introducing impure aluminum into a stoichimetric excess of alcohol in said reactor and removing hydrogen and product aluminum alkoxide from said reactor at rates which provide self-regulation of the rate of production of the aluminum alkoxide product.

4,242,272

SUBSTITUTED PHENETHYLDICHLOROSILANES AND METHOD FOR PRODUCING SAME

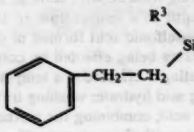
Isao Koga, Yokohamashi; Yohji Terui, Chibashi; Masuhito Ohgushi, and Tohru Kitahara, both of Minamatashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jun. 15, 1978, Ser. No. 915,654

Int. Cl.³ C07F 7/08

U.S. Cl. 556—489 **3 Claims**

1. A substituted phenethyldichlorosilane having the general formula



wherein R^3 is an alkyl group having 3–20 carbon atoms or phenethyl group.

4,242,273

4-(MONOALKYLAMINO)BENZOIC ACID AMIDES AND IMIDATES

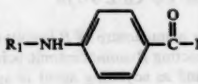
Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 836,949, Sep. 27, 1977, Pat. No. 4,136,256. This application Oct. 12, 1978, Ser. No. 950,899

Int. Cl.³ C07C 143/52, 101/42, 97/10, 103/22

U.S. Cl. 260—453 RW **10 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is n-hexadecyl, R_2 is hydrogen and R_3 is selected from the group consisting of $—SO_2C_6H_5$, $—SO_2C_6H_4CH_3$, $—SO_2CH_3$, $—CH_2CHOHCH_2OH$, $—CH_2CO_2H$, $—CH_2CH_2SO_3H$, benzoyl, —NH—CO—CH_3 and allyl.

4,242,274

PROCESS FOR THE PREPARATION OF 2,2-DIPHENYL-4-(DIMETHYLAMINO)-PENTANE NITRILE

John J. Taylor, St. Peters, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 18, 1979, Ser. No. 49,412
Int. Cl.³ C07C *97/10, 121/78*
U.S. Cl. 260—465 E 8 Claims

1. A process for the preparation of 2,2-diphenyl-4-(dimethylamino)-pentane nitrile comprising the steps of:

preparing a charge mixture comprising diphenylacetonitrile, 1-(dimethylamino)-2-halopropane, a base, water, a water-immiscible organic solvent, and a quaternary salt selected from the group consisting of tetrabutylammonium halides, tetrabutylammonium hydrogen sulfate, cetyltrimethyl ammonium halides, methyltrialkyl (C_8–C_{10}) ammonium halides and benzyltriphenylphosphonium halides; and

heating said mixture under an inert atmosphere to effect formation of 2,2-diphenyl-4-(dimethylamino)-pentane nitrile by reaction of diphenylacetonitrile, 1-(dimethylamino)-2-halopropane and base.

4,242,275

PROCESS FOR THE PREPARATION OF ISOMER-FREE TOLUENE-4-SULFONIC ACID

Otto Arndt, Hofheim am Taunus, and Bernhard Mees, Ehlhalten, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 950,582, Oct. 12, 1978, abandoned, which is a continuation of Ser. No. 769,037, May 11, 1977, abandoned. This application Dec. 5, 1979, Ser. No. 100,462
Int. Cl.³ C07C *143/24*
U.S. Cl. 260—505 E 25 Claims

1. A process for the preparation of toluene-4-sulfonic acid, which comprises heating toluene with sulfuric acid of at least 85% by weight strength to a temperature of up to 140° C.; crystallizing toluene-4-sulfonic acid formed in the form of its hydrate, said crystallizing being effected by cooling the reaction mixture if the heating is effected at a temperature of more than 110° C.; isolating said hydrate; washing it free of isomers with aqueous sulfuric acid; combining the mother liquor separated from said hydrate with the aqueous sulfuric acid used in said washing; heating these at a temperature of from 120° to 160° C. for a time sufficient to form additional toluene-4-sulfonic acid; cooling the combination of mother liquor and aqueous sulfuric acid to crystallize the toluene-4-sulfonic acid in the form of its hydrate; and isolating the hydrate.

4,242,276

PROCESS FOR THE MANUFACTURE OF β-ISOBUTYRYLAMINOCROTONIC ACID AMIDE

Bernd Schilling, Munich, Fed. Rep. of Germany, assignor to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,778
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853887
Int. Cl.³ C07C *97/16*
U.S. Cl. 564—159 8 Claims

1. A process for the manufacture of β-isobutyrylaminocrotonic acid amide by reacting β-aminocrotonic acid amide with an isobutyryl compound as acylating agent in approximately stoichiometric amounts, in the presence of a solvent and with heating, characterized in that dimethylketene is used as the acylating agent and the reaction is carried out in the range of from room temperature to 70° C. with applicaton of external heat.

4,242,277

NITROSATION PROCESS

Morihisa Tanaka; Kazuhiko Konno; Norio Sasaki, and Kunio Uchimura, all of Ami, Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo, Japan

Filed May 30, 1979, Ser. No. 43,905
Claims priority, application Japan, Jun. 5, 1978, 53/67447
Int. Cl.³ C07C *131/00, 87/60*
U.S. Cl. 260—396 11 Claims

1. In the process for the preparation of benzoquinone oxime compounds by subjecting a phenolic compound to nitrosation reaction conditions of nitrite ion in an aqueous system, the improvement which comprises: conducting said nitrosation reaction in the presence of an acid stronger than nitrous acid, an organic acid having a pKa of 2 to 5 and water, the quantities of the organic acid and water being up to 5 times by mole and up to 10 times by weight respectively the quantity of the compound to be nitrosated.

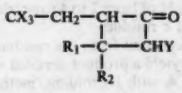
4,242,278

PROCESS FOR THE PREPARATION OF 2-(2',2',2'-TRIHALOGENOETHYL)-4-HALOGENOCYCLOBUTAN-1-ONES

Pierre Martin, Rheinfelden; Hans Greuter, Elken; Eginhard Steiner, Füllinsdorf, and Daniel Bellus, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 891,412, Mar. 29, 1978, abandoned. This application Oct. 3, 1978, Ser. No. 948,126
Claims priority, application Switzerland, Mar. 31, 1977, 4071/77; Nov. 24, 1977, 14404/77; Feb. 23, 1978, 1974/78; Sep. 25, 1978, 9992/78
Int. Cl.³ C07C *45/45, 49/105, 49/115*
U.S. Cl. 568—341 21 Claims

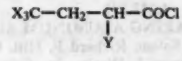
1. A process for the preparation of a 2-(2'-2'-2'-tri-halogenoethyl)-4-halogenocyclobutan-1-one of the formula I



(I)

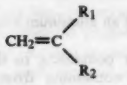
in which one of the radicals R_1 and R_2 is methyl and the other is hydrogen or methyl, R_1 and R_2 together are an alkylene group having 2 to 4 carbon atoms, and X and Y are each chlorine or bromine,

which comprises reacting, at a temperature of from about 0°–200° C., a 2,4,4,4-tetrahalogenobutyric acid chloride of the formula II



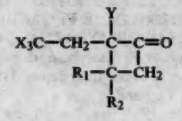
(II)

in which X and Y are as defined under formula I, in the presence of an organic base with an olefin of the formula III



(III)

in which R_1 and R_2 are as defined under formula I, said base and said olefin being, respectively, present in at least equimolar amounts relative to said acid chloride, to give a 2-(2',2',2-trihalogenoethyl)-2-halogenocyclobutan-1-one of the formula IV



(IV)

in which R_1, R_2, X and Y are defined under formula I, and then rearranging the latter, in the presence of about 0.1 to 15%, by weight of said butane-1-one, of an acid, base or quaternary ammonium halide catalyst, into a 2-(2',2',2'-trihalogenoethyl)-4-halogenocyclobutan-1-one of the formula I; said rearrangement being conducted at a temperature of from about 60°–150° C. when in a melt system and at a temperature of 0°–150° C. when in an inert organic solvent system.

4,242,279

2-(2,2-DIHALOVINYL)-3,3-DIMETHYLCYCLOPROPYLACETONE PYRETHROID INTERMEDIATES

Pieter A. Verbrugge, and Petrus A. Kramer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

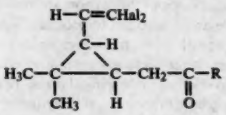
Division of Ser. No. 32,847, Apr. 24, 1979. This application Sep. 24, 1979, Ser. No. 78,275

Claims priority, application United Kingdom, Aug. 17, 1978, 33763/78

Int. Cl.³ C07C *49/23*

U.S. Cl. 568—303 **4 Claims**

1. A compound of the formula:



wherein R represents an alkyl group containing from 1 to 4 carbon atoms and Hal_2 two halogen atoms having an atomic number of from 9 to 35.

4,242,280

PROCESS FOR THE PREPARATION OF HALOGENO-MERCURI-ALDEHYDES AND -KETONES

Serge L. Lecolier, Janville sur Juine; Thierry A. Malfroot, Saint Germain les Corbeil; Marc D. Piteau, Itteville, and Jean-Pierre G. Senet, Melun, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 11, 1978, Ser. No. 968,281

Claims priority, application France, Dec. 23, 1977, 77 39004

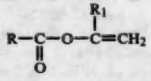
Int. Cl.³ C07C *47/14, 47/52*

U.S. Cl. 260—431 **13 Claims**

1. A one step process for the synthesis of a halogeno-mercuri-aldehyde or -ketone, of formula

$$XHgCH_2—COR_1$$

in which R_1 is H or methyl, X is Cl or Br which comprises reacting an alkenyl ester of a carboxylic acid with mercuric chloride or bromide in the presence of water, said alkenyl ester of said carboxylic acid having the formula



in which R_1 is as defined hereinabove, R is H or an alkyl of 1 to 12 carbon atoms or phenyl, said reaction being carried out in the presence of an acid acceptor, at a temperature between −10° C. and +60° C. and isolating said halogeno-mercuri-aldehyde or ketone from the reaction mixture.

4,242,281

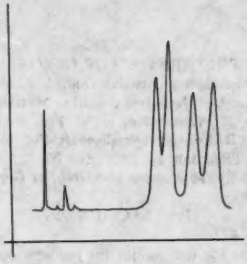
PROCESS FOR PREPARING 6-HYDROXY-2,6-DIMETHYLHEPTANAL AND INTERMEDIATES THEREOF

Mark A. Sprecker, Sea Bright; Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 52,355, Jun. 27, 1979, abandoned, which is a division of Ser. No. 961,685, Nov. 17, 1978, abandoned. This application Oct. 26, 1979, Ser. No. 88,519

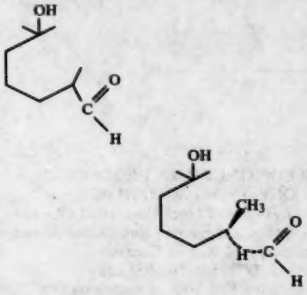
Int. Cl.³ C07C *47/19*

U.S. Cl. 568—458 **1 Claim**

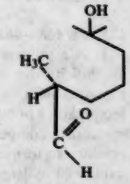


GC PROFILE , EXAMPLE I.

1. A process for preparing 6-hydroxy-2,6-dimethylheptanal defined by one of the structures:



or



comprising the steps of (1) forming an emulsion of 2,6-dimethyl-5-heptenal with water using an emulsifying agent which is an alkali metal salt of a long chain fatty acid; (2) reacting sodium sulfite with the 2,6-dimethyl-5-heptenal in the presence

of boric acid while it is in the emulsion whereby a sulfite-aldehyde addition salt of 2,6-dimethyl-5-heptenal is formed, the reaction taking place at a temperature of between 10° C. and 50° C., the mole ratio of sodium sulfite:2,6-dimethyl-5-heptenal varying between 1:1 up to 10:1; the concentration of sodium sulfite in the reaction mass being from 0.1 molar up to 3.0 molar and the concentration of 2,6-dimethyl-5-heptenal being from 0.5 molar up to 2.0 molar; and (3) hydrolyzing the resulting sulfite-aldehyde addition salt of 2,6-dimethyl-5-heptenal with hydrochloric acid using from 10% up to 50% hydrochloric acid, the mole ratio of HCl:sulfite addition salt of 2,6-dimethyl-6-hydroxy-heptanal being 0.5:1 up to 1.5:1 with the reaction temperature for the hydrolysis reaction varying from 0° C. up to 50° C.

4,242,282

PREPARATION OF GLYOXAL

Hans Diem, Mannheim; Christian Dudeck, Limburgerhof; Gunter Lehmann, Ludwigshafen; Guenther Matthias, and Norbert Petri, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,331

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803318

Int. Cl.³ C07C *45/29*

U.S. Cl. 568—471 **14 Claims**

1. A process for the continuous preparation of glyoxal by oxidizing ethylene glycol in the presence of a catalyst consisting essentially of silver in crystalline form at an elevated temperature, wherein the oxidation is carried out in the presence of said crystalline silver, the crystals having particle sizes of from 0.1 to 2.5 millimeters, and of a gas inert under the reaction conditions, in a ratio of at least 4.4 moles of said inert gas per mole of oxygen, with a residence time of at most 0.05 second, at from 720° to 980° K.

4,242,283

PROCESS FOR CONTINUOUSLY PRODUCING OXYGEN-CONTAINING COMPOUNDS

Josef Hibbel; Gunther Kessen, and Josef Meis, all of Oberhausen, Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 953,226

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747302

Int. Cl.³ C07C *45/50, 27/20*

U.S. Cl. 568—451 **9 Claims**

1. In a process for continuously producing an aldehyde or alcohol by the oxo process by contacting an olefin, carbon monoxide and hydrogen at a pressure of 5 to 1000 bar and at a temperature of 50° to 200° C. in the presence of a Group VIII metal or a compound thereof as catalyst wherein the reaction product so formed comprising unreacted olefin, carbon monoxide and hydrogen is passed to a high pressure gas separator the improvement wherein olefin which has not been reacted in the reactor is reacted in the high pressure gas separator under oxo process conditions comprising a pressure of 5 to 1000 bars and a temperature of 50° C. to 200° C. to form an aldehyde or alcohol.

4,242,284

PROCESS FOR RECOVERY OF RHODIUM VALUES AND TRIPHENYLPHOSPHINE FROM RHODIUM CATALYZED HYDROFORMYLATION MEDIUM

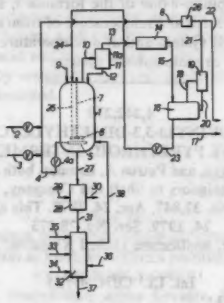
Norman Harris, and Thomas F. Shevels, both of Stockton-on-Tees, England, assignors to Davy International (Oil & Chemicals) Limited, London, England

Filed Jul. 26, 1979, Ser. No. 60,754

Claims priority, application United Kingdom, Jul. 27, 1978, 31366/78

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **9 Claims**



1. In a process for hydroformylating an α-olefinic compound containing from 2 to about 20 carbon atoms by reaction with carbon monoxide and hydrogen to produce an aldehydic compound or a mixture of aldehydic compounds having one more carbon atom than the α-olefinic compound which comprises:

reacting the α-olefinic compound in a hydroformylation zone with carbon monoxide and hydrogen at a temperature of up to about 160° C. and at a total pressure of up to about 50 kg/cm² absolute in a liquid reaction medium which contains aldehydic product or products, polymeric aldehyde condensation products and a soluble rhodium complex catalyst comprising rhodium in a complex combination with carbon monoxide and a triphenylphosphine and in the presence of excess triphenylphosphine;

the improvement which comprises:

contacting constituents of the liquid reaction medium with a liquid extractant phase comprising at least about 60% by weight phosphoric acid;

separating an organic phase now depleted in rhodium and triphenylphosphine from extractant phase;

recovering rhodium values and triphenylphosphine from separated extractant phase; and

recycling at least one of recovered rhodium values and recovered triphenylphosphine to the hydroformylation zone.

4,242,285

NOVEL 2,6-DINITROPHENYL SELENIUM COMPOUNDS AND THEIR USE AS EPOXIDATION CATALYSTS

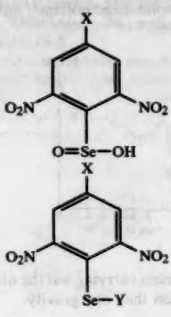
James M. Renga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 16, 1979, Ser. No. 21,272

Int. Cl.³ C07C *163/00*; C07D *301/12*; B01J *27/02*

U.S. Cl. 260—348.31 **11 Claims**

1. A 2,6-dinitrophenyl selenium compound corresponding to the formula I or II



I

II

wherein in each of the above formulas, X is selected from the group consisting of hydrogen, trifluoromethyl, trichloromethyl, nitro, chloro and bromo moieties; and in Formula II, Y is bromine or chlorine.

4. A process for preparing epoxides from olefins comprising admixing an olefin bearing at least one alkyl, aryl or oxyalkyl substituent in an α-position to an olefinic carbon with hydrogen peroxide in a liquid reaction medium in the presence of an effective amount of an epoxidation catalyst prepared by introducing at least one of the compounds described in claim 1 to the reaction medium.

4,242,286

PROCESS FOR PREPARING BENZOTRIFLUORIDE AND ITS DERIVATIVES

Yohnosuke Ohsaka, Takatsuki, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 22, 1979, Ser. No. 22,782
Claims priority, application Japan, Mar. 30, 1978, 53-37681
Int. Cl.³ C07C *25/14*
U.S. Cl. 570—145 **7 Claims**

1. A process for preparing benzotrifluoride or its derivative by contacting benzotrichloride or its derivative corresponding thereto with hydrogen fluoride in a gaseous phase, characterized in that the contact is carried out in the presence of aluminum fluoride.

4,242,287

SILICONE-CONTAINING ELASTOMER AND PROCESS FOR THE PREPARATION THEREOF

Dwight L. Allen, Akron, Ohio, assignor to Akron Catheter, Inc., Chippewa Lake, Ohio

Filed Nov. 22, 1978, Ser. No. 963,085
Int. Cl.³ C08K *5/54, 3/22;* C08L *7/02;* C08K *3/34*
U.S. Cl. 260—746 **2 Claims**

1. A novel homogenous silicone-containing stable elastomeric composition of matter comprising:

a natural rubber latex; and

from about 20 to about 85 parts by weight, based upon the weight of the rubber in said latex, of a masterbatch consisting of

a dimethylpolysiloxane compound having a viscosity average molecular weight of about 7,000 and a viscosity of about 100 centistokes, said compound being present in an amount of more than 10 to about 50 parts by weight, based upon the weight of the rubber in said latex, and being substantially free from phasing;

from about 5 to 15 parts by weight of titanium dioxide, based upon the weight of the rubber in said latex; and,

from about 5 to 20 parts by weight of clay, based upon the weight of the rubber in said latex.

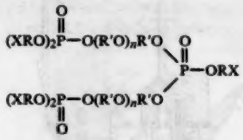
4,242,288

HALOGENATED TRIPHOSPHATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 18, 1979, Ser. No. 49,999
Int. Cl.³ C07F *9/09;* C08K *5/52*
U.S. Cl. 260—929 **10 Claims**

1. A flame retardant composition containing as its major ingredient a compound of the formula:



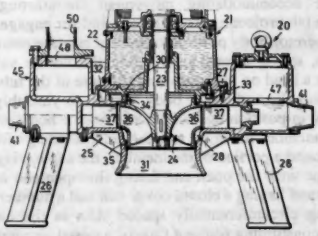
wherein R represents an alkylene radical of from 2 to about 10 carbon atoms and the halosubstituted derivatives thereof, R' represents an alkylene radical of from 2 to 3 carbon atoms, X represents a halogen of chlorine or bromine and n represents an integer of from 1 to 5.

4,242,289

APPARATUS FOR THE REMOVAL OF GASES, ESPECIALLY AIR, IN FLUIDS

Albert Blum, Scheiderhohe, 5204 Lohmar (Rhld.) 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 737,399, Nov. 1, 1976, Pat. No. 4,155,959. This application May 15, 1979, Ser. No. 39,138
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548754
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—93 **26 Claims**

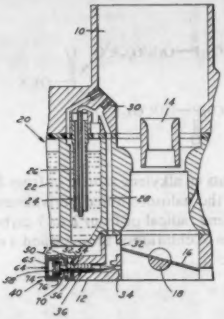


1. An aerator device comprising a submersible unitized electric motor-pump assembly, said assembly including a first housing within which is an electric motor and a shaft projecting outwardly therefrom carrying a pump impeller, a second housing having a liquid chamber in which is located said pump impeller, means in said second housing for defining a first opening through which said pump impeller is insertable into said liquid chamber, means in said second housing for defining a second opening in general axial alignment with said first opening through which liquid is drawn into said liquid chamber, means for removably securing together said first and second housings, a first plurality of nozzles for directing liquid discharged from said liquid chamber in generally radially outwardly directed streams, and means for aerating said streams prior to the discharge thereof into a body of water within which said device is adapted to be submerged.

4,242,290
CARBURETOR IDLE MIXTURE SCREW ENCLOSURE ASSEMBLY

Steven K. Handelsman, and Albert A. Pruchno, both of Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 30, 1979, Ser. No. 62,089
Int. Cl.[3] F02M 3/08
U.S. Cl. 261—41 D 1 Claim



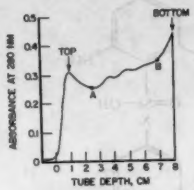
1. An assembly for enclosing the engine idle speed mixture flow adjusting screw of a carburetor to prevent adjustment of the screw so long as the assembly is in place, comprising, in combination, a carburetor body portion having an opening into an engine idle speed mixture flow channel, a needle valve type screw adjustably mounted for movement into and out of the opening to vary mixture flow through the channel, a cup-shaped base member mounted on the carburetor body portion adjacent the opening and extending outwardly therefrom to surround a portion of the screw, and a cap resiliently and nestingly engagable with the outer open end of the base member to complete enclosure of the screw and prevent access thereto for adjustment of the screw so long as the cap and base member are engaged, the cup-shaped member comprising a tubular member closed at one end, the one end containing an aperture accommodating movement therethrough of the screw, a tab projecting from the one end for engagement with the carburetor body portion to prevent relative rotation therebetween, spring means surrounding the needle valve screw between a head on the screw and the base of the tubular member against the carburetor body portion to yieldably hold the assembly in position against the carburetor body portion, the tubular member having a raised bead extending circumferentially around a portion of the member, the cap having a tubular cup-shape with the open end facing the open end of the base member and having a closed cover end and a number of axially extending circumferentially spaced slots in the cap tubular portion constituting resilient fingers, a raised circumferentially extending bead on each of the fingers adapted to mate with the bead on the base member when the base member and cap are nested to form a spring-like locking engagement therebetween completely covering the screw, and an opening through the bead on the base member through which protrudes a portion of the bead on the cap when the cap and base member are nested to permit dissembly of the cap from the base.

4,242,291
COLLAGEN RECONSTITUTION

Kenneth E. Hughes, Gahanna, and Dale P. DeVore, Worthington, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed May 9, 1979, Ser. No. 37,551
Int. Cl.[3] C07G 7/00; B29D 11/00
U.S. Cl. 264—1 7 Claims

1. A method for production of a homogeneous gel matrix of unique collagen fibrils by the old method of precipitation from a solution comprising solubilized collagen molecules wherein

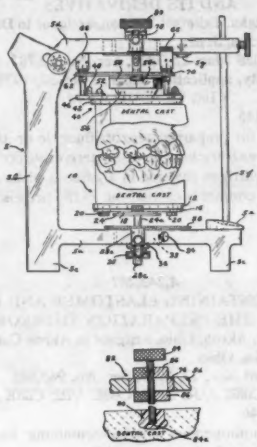


the improvement comprises carrying out the old method under gravitational force of less than one gravity.

4,242,292
METHOD FOR EMBEDDING THREADED APERTURED BUTTON IN BASE OF DENTAL CAST

Roger W. Mercer, 1340 Arlington Dr., Fairborn, Ohio 45324, and Louis E. Hay, 847 Woodhill Rd., Dayton, Ohio 45431

Division of Ser. No. 788,236, Apr. 18, 1977. This application Apr. 9, 1979, Ser. No. 28,536
Int. Cl.[3] B29C 5/00; B29D 3/00
U.S. Cl. 264—16 5 Claims



1. A method of forming a threaded aperture in the base of a hardened dental cast for use in the fabrication of a dental prosthesis, said forming method comprising the steps:

(a) forming a cavity of suitable depth and diameter in the base of said dental cast, said cavity to be substantially perpendicular to the occlusal plane of said dental cast;

(b) filling said cavity to a suitable depth with a fluid cold setting material;

(c) forming a notch in at least one external thread of an elongated threaded member and inserting said member into said fluid cold setting material before it sets; and,

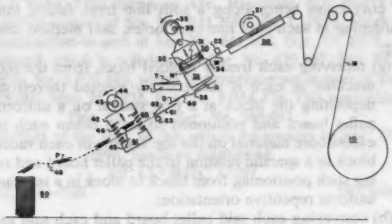
(d) allowing said cold setting material to set around said elongated member and removing said member to form said threaded aperture.

4,242,293

PAPER PLATE FORMING METHOD AND APPARATUS

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 2, 1979, Ser. No. 81,263
Int. Cl.³ B29C *17/00, 3/00;* B28B *9/28*
U.S. Cl. 264—40.7 7 Claims



1. A method of three dimensionally forming articles from paper web drawn from a reeled supply wherein a single ply of such web is cyclically advanced into registered cut position relative to a reciprocating cutting die for production of register cut, article blanks, such blanks being advanced into a heated reciprocating die press for three dimensional shaping into said articles, the improvement comprising the steps of:

A. Driving said cutting die at a reciprocation cycle rate that is at least twice greater than said die press cycle rate;

B. Holding cut article blanks produced within a single cycle interim of said die press in a position clear of said die press; and,

C. Simultaneously releasing said held article blanks for simultaneous loading and forming by said die press within a single cycle thereof.

4,242,294

METHOD FOR ENCAPSULATING A MOLDED CERAMIC MEMBER

Werner Hüther, Karlsfeld; Klaus Schweitzer, Niederpöcking, and Axel Rossmann, Karlsfeld, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 3, 1978, Ser. No. 930,730
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737208
Int. Cl.³ C04B *33/34, 37/00*
U.S. Cl. 264—62 11 Claims

1. In a method for encapsulating a molded member of silicon ceramic material for high-temperature isostatic pressing (HIP); the improvement comprising applying a generally porous coating of a member selected from the group consisting of glass and ceramic material on said molded member; and sintering said coating under a vacuum so as to form a pressure-tight capsule encompassing said molded member.

4,242,295

PROCESS FOR MANUFACTURING FLAT PLASTIC NET

Thomas Urquhart, Cobourg, Canada, assignor to Du Pont Canada Inc., Montreal, Canada

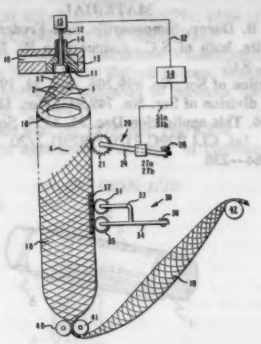
Filed Apr. 2, 1979, Ser. No. 26,206
Claims priority, application Canada, Oct. 4, 1978, 312717
Int. Cl.³ B29C *17/14*
U.S. Cl. 264—146 7 Claims

1. A process for manufacturing flat net from tubular plastic net, comprising the steps of

(a) extruding plastic material through coaxial circular counter-rotating die members so as to form, about an axis of extrusion, a tubular net structure comprising a plurality of crossing strands;

(b) controlling the angular displacement of successive substantially longitudinally-aligned junctions of the crossed strands about the axis of extrusion and relative to a fixed plane passing through the axis of extrusion at a pre-determined value, to minimize said angular displacement;

(c) cutting successive longitudinally-aligned junctions longitudinally and within each junction, along at least one line of successively longitudinally-aligned junctions, such that the tubular net is adapted to be opened into flat net; and



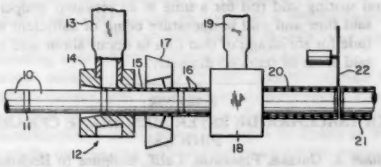
(d) advancing the net under tension during the extrusion and cutting steps.

4,242,296

METHOD FOR MAKING CURVED HOSE

Charles E. Bricker, Centerville, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 27, 1979, Ser. No. 70,205
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—149 17 Claims



11. A method for producing curved hose which comprises, sequentially, the steps of:

a. providing a plurality of rigid, deformable mandrels;

b. arranging said mandrels in end-to-end fashion with a plastic spacing member between each of said mandrels;

c. extruding a first layer of an elastomeric material around said mandrels and said spacing members;

d. applying a reinforcing member around first elastomeric layer;

e. applying a second layer of an elastomeric material around said reinforcing member and said first layer;

f. cutting through said elastomeric material layers and said reinforcing member and said spacing member to provide a plurality of individual hose assemblies on said mandrels;

g. deforming said hose assembly and said mandrel to a preselected curvilinear configuration;

h. at least partially vulcanizing said hose assembly on said mandrel;

i. deforming the resulting partially vulcanized hose and said mandrel to a desired configuration of lesser curvature than said preselected curvilinear configuration;

j. separating said mandrel and said partially vulcanized hose;

k. allowing said partially vulcanized hose to return to said preselected curvilinear configuration;

l. completing the vulcanization of said hose; and,

m. returning said mandrel to said step (b).

4,242,297

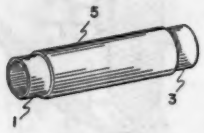
WINDING CORE FOR HEAT SHRINKABLE FILM MATERIAL

Raymond B. Dacey, Simpsonville, and Frederick D. Stringer, Greenville, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 899,205, Apr. 24, 1978, abandoned, which is a division of Ser. No. 749,945, Dec. 13, 1976, Pat. No. 4,114,756. This application Dec. 31, 1979, Ser. No. 108,879

Int. Cl.³ B29C *25/00;* **B29D** *7/20, 7/22*

U.S. Cl. 264—230 **1 Claim**



1. A process for minimizing distortions in a roll of heat shrinkable film suitable for use on automated packaging machinery, said roll generally comprising a core having a transverse direction parallel to an axis of rotation with said film wound in its longitudinal direction about the rotational axis of said core, said film otherwise tending to shrink in the transverse direction in the edge areas thereof and thus elongate longitudinally in said edge areas thereof during storage, said process comprising:

providing a generally cylindrical core having areas of reduced diameter at the terminal portions thereof, and

winding said film about said core, said areas of reduced diameter subtending said edge areas of said film where said film would otherwise tend to elongate, thereby forming said roll of film,

and storing said roll for a time at an elevated temperature, said time and said temperature being of sufficient magnitude for shrinkage of said film to occur about said core in said areas of reduced diameter.

4,242,298

POLYSACCHARIDE ESTER MEMBRANE CLEARING PROCESS

William A. Gurske, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 9, 1979, Ser. No. 55,585

Int. Cl.³ B29B *11/22*

U.S. Cl. 264—233 **16 Claims**

1. A method of clearing a polysaccharide ester membrane comprising rinsing the membrane with a clearing solvent comprised of two components and drying the rinsed membrane, wherein the first component of said clearing solvent is selected from a group consisting of alcohols, ketones, ethers, esters, and mixtures and wherein said second component is selected from a group consisting of methyl acetoacetate, ethyl acetoacetate, acetol, 2-ethoxyethanol, and 2-ethoxyethyl acetate, said first component having a boiling point less than said second component.

4,242,299

APPARATUS AND METHOD FOR REMOVING CORE MARK MATERIAL FROM MOLDED CONCRETE BLOCKS

Roderick D. Adams, 1207 Welcome Cir., Durham, N.C. 27705

Filed Jul. 10, 1979, Ser. No. 56,354

Int. Cl.³ B29C *17/08, 17/12*

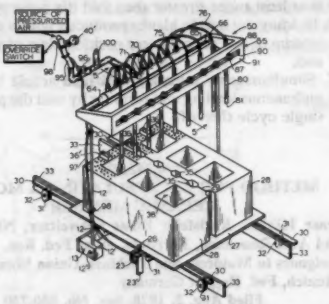
U.S. Cl. 264—504 **12 Claims**

1. In the repetitive formation of concrete block machine molded of a semi-wet mixture of aggregate and cement utilizing a selected number of core bars to form with each core bar plural spaced-apart vertical core holes centered on a core bar line extending the length of the block, a method for removing excess core mark material left on the block's top surface along each such line and adjacent the core holes associated therewith after the block has been ejected from the molding machine and before the block has been cured to avoid such excess core mark material remaining on the surface of the block and in the case of core holes being along a split line from falling into and hardening in such split line core holes, said method comprising:

(a) receiving each freshly molded block from the molding machine as each is successively ejected therefrom and depositing the block at a first station on a uniform size pallet board and positioned so as to orient each line of excess core material on the top surface of each successive block in a specific relation to the pallet board and repeating such positioning from block to block in a substantially uniform repetitive orientation;

(b) conveying each said pallet board and each said molded block positioned thereon through a second station and along a predetermined path and length of travel which repeats itself from pallet board to pallet board;

(c) bringing a selected portion of each said pallet board in continuous physical contact with the actuating portion of a normally open pressure actuated electrical switch fixedly stationed in the path of said pallet board travel



through said second station to cause said switch to be closed for the time interval corresponding to said length of travel and to be open when not in such physical contact with a said pallet board;

(d) passing each said block and pallet board while traveling through said second station and while said switch is closed below an air supply system associated with said machine and having:

(i) an electrically actuated valve operatively associated with said switch and having an air inlet connected to a source of pressurized air and an air outlet for discharging such pressurized air while said switch is closed during travel of each said pallet through said second station; and

(ii) for each said line of core mark material at least one positionable conduit communicating at one end to the said valve discharge outlet and having at an opposite end an air discharge port; and

(e) while each said block and pallet board passes through said second station locating and fixing each said positionable conduit such that the air discharge port associated therewith is at an appropriate elevation, lateral position and angularly directed with respect to a selected said line of excess core material so as to continuously direct pressurized air from each respective said air discharge port toward a selected line of core mark material on the top surface of said block during the course of the block's travel through said second station while said switch is

closed and said valve is open in a manner such that substantially all excess core material is blown clear of the top surface of said block and prevented from falling and hardening in any of such core holes associated with a split line.

4,242,300

METHOD FOR PROCESSING PARISONS

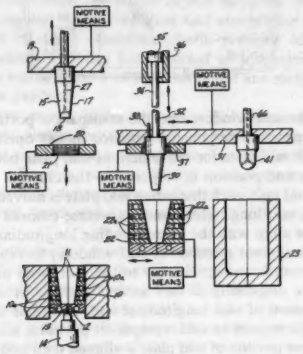
Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 911,359, Jun. 1, 1978, which is a continuation-in-part of Ser. No. 641,638, Dec. 17, 1975, abandoned, which is a division of Ser. No. 479,287, Jun. 14, 1974, Pat. No. 3,970,419, which is a continuation-in-part of Ser. No. 473,580, May 24, 1974, Pat. No. 3,966,378. This application Dec. 12, 1978, Ser. No. 968,681

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—520 **13 Claims**



1. In a method for temperature conditioning an organic plastic parison for the operation of multi-axial orientation such as by stretching and expanding, the improvement which comprises: providing said parison at an elevated temperature above that required for orientation of said plastic; retaining and cooling said parison in a first mold assembly which includes a first mold, a mold cavity, a neck mold and a core, wherein said first mold and first core are maintained at temperatures below that required for orientation, but said first mold is maintained at a lower temperature than said core to assure rapid removal of heat from said parison; separating said core from said parison while retaining and cooling said parison in said first mold wherein separation of said parison and said core is effected by applying positive fluid pressure inside said parison while said separation of the core is taking place and thereby facilitating removal of the core from the parison and avoiding the formation of a vacuum inside the parison during said separation; separating said parison and said first mold from each other after a substantial change in the heat content of said parison will have taken place, wherein the heat content of said parison is altered by means of heat exchange with said core and mold to result substantially in the heat content of the parison having an average temperature suited for orientation, wherein said altering is effected at temperature gradients adapted for rapid heat flow and with an unequal distribution of temperature resulting across the walls of the parison; and locating the parison in an environment capable of influencing the cross-sectional temperature distribution in the walls of said parison, with said locating facilitated by said neck mold, wherein the temperature of the outside surface of said parison is lower than the temperature of its inside surface at the time said parison is located in said environment, and equalizing the temperature distribution of the parison in said environment without substantially altering the heat content of said parison to attain a temperature substantially corresponding to the orientation temperature.

4,242,301

AUTOMATED REACTION HOUSING FOR USE IN QUANTITATIVE ANALYSIS

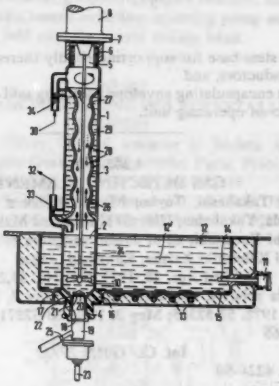
Guido Heyneman, Knokke; Christiaan Vandenbossche, Zwijnaarde, both of Belgium, and Roland Thieme, Maximiliansau, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich

Filed Jan. 18, 1979, Ser. No. 4,370

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2804287

Int. Cl.³ G01N *1/10*

U.S. Cl. 422—68 **3 Claims**



1. A reaction housing for an automatically operating quantitative analysis device comprising, in combination,

a reaction chamber having an outlet at a bottom portion thereof and an inlet at a top portion thereof, said outlet including a mouth located at a given plane;

a hollow column connected to said chamber at said top portion thereof, said column being surrounded by a cooling jacket having a heat-exchange fluid flowing therein;

a thermostatically controllable heating bath means at least partially surrounding said reaction chamber for heating a reaction mixture in said chamber; and

an automatically controllable valve means positioned in said outlet of said reaction chamber, said valve means including a cap having sealing edges normally positioned in said given plane to completely seal said outlet mouth, said valve means extending below said bath means for completely draining fluids within said reaction chamber.

4,242,302

METHOD OF MAKING A CATALYTIC COMBUSTION TYPE GAS DETECTOR

Kenzo Kitamura, Tokyo; Hideaki Ebitani, Omiya, and Masahiro Asakura, Urawa, all of Japan, assignors to Kabushiki Kaisha Shibaura Denshi Seisakusho, Urawa, Japan

Filed Aug. 23, 1978, Ser. No. 936,032

Claims priority, application Japan, Sep. 2, 1977, 52/105434

Int. Cl.³ G01N *27/16*

U.S. Cl. 422—94 **6 Claims**

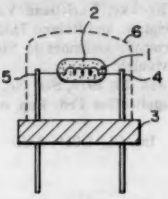
4. A gas detector which comprises:

(a) a wire coil of a metal which is difficult to become oxidized at elevated temperatures;

(b) a pair of electric terminal conductors connected to said wire coil;

(c) a mixture of a first powder and a second powder coated and sintered onto said wire coil; said first powder consist-

ing of an oxide selected from the group consisting of TiO_2, ZrO_2, Y_2O_3, HfO_2, CeO_2, La_2O_3, NiO and Cr_2O_3, and said second powder consisting of an oxide selected from the group consisting of ZnO, SnO_2 and In_2O_3; said second powder being in an amount of less than 40% by weight, based on the total weight of the mixture;



(d) a stem-base for supporting rigidly thereon said terminal conductors; and

(e) an encapsulating envelope enclosing said coated wire coil into an operating unit.

4,242,303

GAS DETECTING ELEMENT

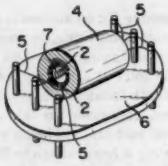
Takashi Takahashi, Toyko; Masaki Katsura, Mitaka; Tadao Kaneda, Yokohama; Hideaki Hiraki, and Masayuki Shiratori, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 25, 1979, Ser. No. 33,251

Claims priority, application Japan, May 2, 1978, 53-52361; May 2, 1978, 53-52365; May 2, 1978, 53-52371; Aug. 31, 1978, 53-105565

Int. Cl.³ G01N *27/12*

U.S. Cl. 422—98 **3 Claims**



1. A gas detecting element comprising a hollow cylindrical insulative body, a pair of electrodes provided on the outer circumference of said insulative body and a gas sensitive material layer covering up the outer periphery of said insulative body and said electrodes, wherein the gas sensitive material layer comprises:

an N-type metal oxide semiconductor;

0.005 to 8% by weight, based on the metal oxide, of at least one noble metal catalyst selected from the group consisting of platinum (Pt), palladium (Pd) and rhodium (Rh); and

phosphorus in an amount of 1.5 to 30 times in mol ratio as much as that of the noble metal or 0.05 to 30 times in mol ratio as much as that of palladium where palladium alone is used as the noble metal catalyst.

4,242,304

CONTACT LENS DISINFECTOR WITH TEMPERATURE INDICATOR

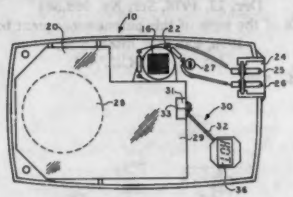
Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.

Filed Jun. 22, 1979, Ser. No. 51,123

Int. Cl.³ G01D *11/26*; A01L *2/100*; G01K *5/62*

U.S. Cl. 422—119 **3 Claims**

1. A disinfector unit for contact lenses comprising, a housing, heating means arranged for heating the contact lenses to a desired temperature and indicating means for providing a visual message for impression to the user that the unit is in a selected temperature condition, said indicating means comprising a generally opaque viewing window including a plurality of longitudinal and transverse transparent portions arranged to define a series of segmented characters providing a visual, word message, a plate having an upper surface including an opaque background corresponding to the opaque portions of said viewing window and a series of longitudinal and transverse portions of a selected color which correspond in size, shape and arrangement to the transparent portions of said viewing window, means mounting said plate below said viewing window for slidable movement in a diagonal direction with



respect to said window and the transparent portions thereof, and temperature responsive actuator means operatively coupled with said plate for movement of said plate between a first and a second position in response to the changes of temperature of said unit, such that when said plate is moved to said first position, said longitudinal and transverse colored portions on said plate align with the corresponding longitudinal and transverse transparent portions of said window, thereby providing a visual word message display to the user, with movement of said plate diagonally to said second position producing total misalignment of said longitudinal and transverse colored portions with respect to said transparent portions, such that only the opaque portion of said plate is aligned with said transparent portion, thereby totally obliterating said work message.

4,242,305

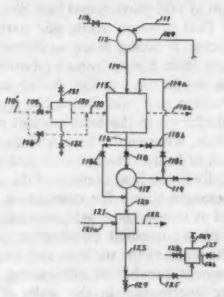
APPARATUS FOR CONTROLLING EMISSIONS OF HYDROGEN SULFIDE FROM A SYSTEM UTILIZING GEOTHERMAL STEAM

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, New Rochelle, N.Y.

Division of Ser. No. 712,170, Aug. 6, 1976, Pat. No. 4,123,506. This application Aug. 18, 1978, Ser. No. 934,846

Int. Cl.³ B01J *10/00*; C01B *17/16, 31/20*

U.S. Cl. 422—129 **22 Claims**



1. Apparatus for utilizing a flow of geothermal steam at superatmospheric pressure containing noncondensable gases together with hydrogen sulfide as impurities therein, and for producing therefrom discharges of liquid water and of noncon-

densable gases that are substantially free of hydrogen sulfide, which apparatus comprises:

(a) reactant supply means for providing an aqueous liquid phase containing reactant dispersed therein having the capability of undergoing reaction with hydrogen sulfide at the temperature of and in the presence of said flow of geothermal steam to form a solid metal sulfide reaction product suspended in said flow of liquid; and liquid flow means, including conduits, connected from said reactant supply means for providing a flow of said aqueous liquid phase;

(b) extractor means having steam and liquid phase inlets and outlets and means for passing said flow of geothermal steam at superatmospheric pressure in contact with said flow of aqueous liquid phase and effecting said reaction with hydrogen sulfide therein, the liquid phase inlet being connected to said liquid flow means and the steam inlet being connected to receive said flow of geothermal steam from a geothermal source;

(c) separator means connected in said extractor means for separating and recovering from said contact the resulting flow of steam at superatmospheric pressure containing noncondensable gases but depleted in hydrogen sulfide and the resulting flow of aqueous liquid ane metal sulfide reaction product;

(d) delivery means, including conduits, connected to said separator means for delivering said recovered flow of steam at superatmospheric pressure for said utilizing;

(e) steam utilization means including condenser means connected to said delivery means for receiving and utilizing recovered steam and for condensing liquid water therefrom;

(f) liquid discharge means connected to said condenser means for discharging therefrom liquid water condensate substantially free of hydrogen sulfide; and

(g) gas discharge means connected to said condenser means for discharging therefrom noncondensable gases substantially free of hydrogen sulfide.

4,242,306

PROCESS AND APPARATUS FOR THE PRODUCTION OF A FOAMABLE MIXTURE FROM AT LEAST TWO FLUID, FOAM FORMING REACTANTS AND AGGREGATES

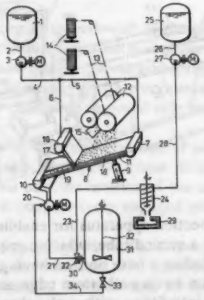
Karl D. Kreuer, and Klaus Schulte, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 25, 1979, Ser. No. 42,683

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828506

Int. Cl.³ B01J *19/18;* C08G *18/14, 9/00*

U.S. Cl. 422—133 **7 Claims**



1. An apparatus for mixing foam forming reactants comprising:

(A) storage containers for foam producing reactants,

(B) metering pump means,

(C) mixing head means for mixing said reactants,

(D) first conduit means leading from one of said storage containers via said metering pump means to said mixing head means to convey reactants thereto,

(E) moving film forming means having surface means thereon and film applicator means for applying a film of liquid reactant to said surface means,

(F) second conduit means connected to another of said storage containers and communicating with said applicator means for supplying a reactant thereto,

(G) aggregate feed means associated with said surface means for applying an aggregate material to said surface means,

(H) collecting means located at one end of said surface means for collecting liquid-aggregate mixture, and

(I) third conduit means including metering pump means for conveying said mixture to said mixing head.

4,242,307

DEVICE FOR PRODUCING POLYCRYSTALLINE SILICON

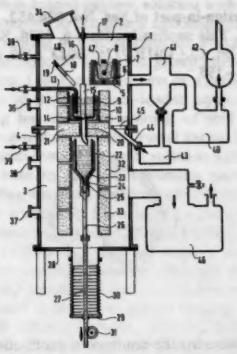
Jacques Fally, Orsay, France, assignor to Societe Anonyme Dite: Compagnie Generale d'Electricite, Paris, France

Filed Jun. 13, 1979, Ser. No. 48,116

Claims priority, application France, Jul. 11, 1978, 78 20660

Int. Cl.³ B01J *8/04;* B01D *9/00;* C01B *33/02;* C30B *11/02*

U.S. Cl. 422—194 **9 Claims**



1. A device for producing polycrystalline silicon by purifying silicon which contains impurities and solidifying a liquid molten mass of purified silicon by subjecting the liquid mass to a vertical temperature gradient, said device comprising:

a chamber,

a first crucible within said chamber for containing a mixture of carbon and silica,

means for heating said first crucible, and

means for tilting said crucible about a horizontal axle,

a second crucible positioned within said chamber below said first crucible and positioned to receive the liquid bath of molten silicon which contains impurities upon tilting of said first crucible about said horizontal axle,

said second crucible having a drainage orifice within a lower part thereof,

movable means for stopping said drainage orifice,

a pipe passing through the wall of said chamber and leading to the inside of said second crucible,

means for connecting said pipe to a source of gas for bubbling through the molten silicon,

means for heating said second crucible to maintain the temperature of said bath above the melting point of silicon,

a vertical receptacle disposed beneath said second crucible and positioned relative to said orifice so as to receive the

purified liquid silicon flowing from said orifice when said orifice is not stopped,

a heating sleeve surrounding said receptacle and means for maintaining the temperatures at the top and bottom of said sleeve respectively higher and lower than the melting point of silicon,

means for vertically moving said receptacle along the axis of said sleeve, and

pumping means for pumping the gases out of said chamber.

4,242,308

CONTROLLABLE REACTION MEDIUM SINGLE REACTOR FOR PHOSPHORIC ACID PRODUCTION

Neculai Popovici, B-dul 1 Mai nr. 42-52; Mihail Dochia, B-dul 1 Mai nr. 164, both of Bucuresti; Mihai Dumitrescu, Str. Grindului nr. 2; Iosif Spirea, Str. Brebeni, Bloc 3, both of Ploiesti, and Iacob Samoil, Sos. Oltenitei nr. 81, Bucuresti, all of Romania

Continuation-in-part of Ser. No. 894,452, Apr. 7, 1978, abandoned. This application Nov. 6, 1978, Ser. No. 957,949

Int. Cl.[2] B01F *7/16;* **B01J** *1/20, 8/10*

U.S. Cl. 422—195 **3 Claims**

1. In apparatus for the continuous production of phosphoric acid from phosphate-containing rock and sulfuric acid, consisting of a reaction tank with a vertical wall, a planar horizontal bottom and cover, and a rigid vertical baffle dividing the reaction tank into two distinct zones, a plurality of agitators to induce circulation and flow of the reaction mixture from one side of the baffle to the other, wherein the improvement comprises the following features:

(a) the reaction tank has a cylindrical side wall;

(b) the vertical baffle is S-shaped with one end smoothly merging into the cylindrical side wall of the reaction tank and the other end freely projecting into the tank;

(c) the S-shaped baffle extends the full height of the reaction tank and divides the reaction tank into two distinct zones;

(d) a first reaction zone on one side of the baffle, having a smaller area and capacity, which initially receives the reactants;

(e) a second, so-called reaction completion zone on the opposite side of the S-shaped baffle with greater capacity, wherefrom a recirculating slurry and reaction product are withdrawn, the approximate ratio between the capacities of said first and second reaction zones respectively being about 1:2; and wherein

(f) the S-shape of the baffle forces the reaction mixture to travel around the tip of the baffle.

4,242,309

APPARATUS FOR OZONIZING UNSATURATED COMPOUNDS

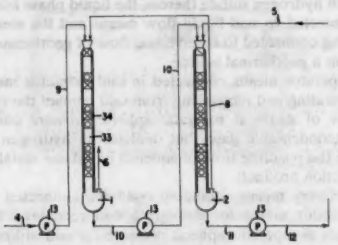
Franz-Josef Carduck, Haan; Axel Dräger, Düsseldorf; Gunter Effey, Monheim; Suresh Majmudar, Haan, and Martin Witthaus, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 966,946, Dec. 6, 1978, Pat. No. 4,185,025, and a continuation-in-part of Ser. No. 888,528, Mar. 21, 1978, abandoned. This application May 30, 1979, Ser. No. 43,619

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754366

Int. Cl.[3] B01J *1/00;* **C10G** *34/00*

U.S. Cl. 422—189 **9 Claims**



1. Apparatus for the continuous ozonization of higher molecular weight olefinically unsaturated organic compounds in the presence of water, wherein a reactor system is provided having at least two reactors which are connected in a counterflow arrangement with respect to each other but through each of which individually the charge mixture to be ozonized and the ozonic gas pass in parallel flow, the individual reactors having static mixing components of such a type and arrangement that an intimate mixture of reactants, water and reaction product is ensured, which mixture is intensified with an increasing degree of ozonization.

4,242,310

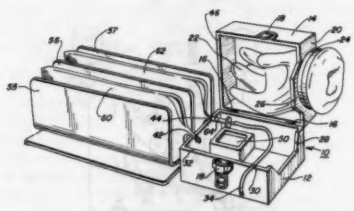
STERILE CONNECTION APPARATUS

Richard Greff, Ingleside; Ludwig Wolf, Jr., Crystal Lake; John Munsch, Libertyville, and Layton C. Kinney, Chicago, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 13, 1978, Ser. No. 959,610

Int. Cl.[3] A61L *2/00*

U.S. Cl. 422—300 **2 Claims**



1. Sterile connection apparatus for enabling the connection of a first tube to a second tube, which comprises:

a housing including a base portion having a top edge and a cover portion having a bottom edge, said portions being adapted for interfitting with each other along their edges to provide a substantially closed interior volume;

said housing including means for receiving and holding said

first tube and means for receiving and holding said second tube;

said receiving means comprising grooves in the edge of the base portion or the cover portion for receiving and holding said tubes with the portions of the tubes to be sterilized extending inside the housing and other portions of the tubes being outside the housing;

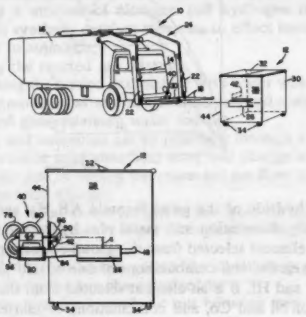
means carried by said housing, located within said housing and operable from outside said housing for enabling manipulation of one of said tube portions inside the housing with respect to the other tube portion inside the housing; and

means for sterilizing said inside tube portions within the substantially closed interior volume.

4,242,311
GARBAGE AND TRASH CONTAINER SELECT SPRAY SYSTEM

Ralph E. Middaugh, 144 Holiday Dr., Martinez, Ga. 30907

Filed Mar. 8, 1979, Ser. No. 18,498
Int. Cl.³ B08B *3/10*; A61L *2/18, 11/00*; B08B *9/00*
U.S. Cl. 422—302 **6 Claims**



1. A select spray system in combination with a front loading, waste transporting vehicle for spraying a treating material into a waste receiving container, the container being structured to be lifted by and to empty its contents into the cooperating waste transporting vehicle, the spray system comprising:

a spray nozzle assembly for dispensing the treating material into the container, from a supply reservoir carried on the vehicle, said spray nozzle assembly being carried on a front cross bar which extends between a pair of spaced, forwardly extending dumping forks on the vehicle, said spray nozzle assembly being selectively controllable from within the vehicle;

a spray access door in an end wall of the container for affording access to an interior portion of the container, said spray access door being adjacent said spray nozzle assembly when said dumping forks are cooperatively engaging pickup sleeves carried on opposed side walls of the container;

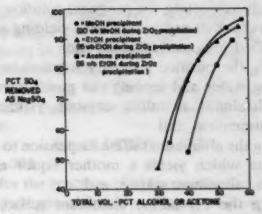
means for selectively inserting a portion of said spray nozzle assembly through said spray access door to spray the treating material into the interior of the container when the container is cooperatively engaged with the vehicle; and

means for retracting said portion of said spray nozzle assembly away from the container after spraying is completed whereby the treating material may be sprayed into the container after any waste in the container has been transferred to the vehicle and while the container is still cooperatively engaged with the vehicle.

4,242,312
REMOVAL OF SODIUM SULFATE FROM A SULFATE-CONTAINING SODIUM CHLORIDE SOLUTION IN A PROCESS FOR SEPARATING ZIRCONIUM AND HAFNIUM

Ronald A. Guidotti, Butte, Mont., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 7, 1979, Ser. No. 64,608
Int. Cl.³ C01G *23/00*; C01D *15/06*
U.S. Cl. 423—73 **10 Claims**



1. A process for separating zirconium and hafnium comprising (1) extracting an aqueous sulfuric acid solution containing zirconium and hafnium ions with an organic extracting solution to produce a zirconium-loaded organic solution; (2) contacting the zirconium-loaded organic solution with an aqueous sodium chloride solution to produce a zirconium-loaded aqueous solution; (3) adding a first amount of a water-miscible organic precipitant selected from the group consisting of an alcohol having from 1 to 3 carbon atoms or a ketone having 2 or 3 carbon atoms to the zirconium-loaded aqueous solution, said amount being less than the amount of said precipitant required to produce sodium sulfate crystal formation, (4) contacting the zirconium-loaded aqueous solution with a zirconium-precipitating base to form a zirconium precipitate; (5) passing the resulting treatment mixture to a separation stage from which there is obtained the zirconium precipitate and a sodium sulfate-containing sodium chloride solution; (6) adding a second amount of the water-miscible organic precipitant to the sodium sulfate-containing sodium chloride solution, the total amount of said precipitant being sufficient to provide a concentration of said organic precipitant ranging from about 26 up to about 60 volume percent, whereby sodium sulfate crystals are formed; (7) separating said sodium sulfate crystals from the sodium sulfate-containing sodium chloride solution; and (8) removing said organic precipitant prior to recycling the resulting aqueous sodium chloride solution to strip zirconium.

4,242,313
PROCESSES FOR THE RECOVERY OF ALUMINA FROM FLY ASH AND PRODUCTION OF CEMENT CONSTITUENTS

Arpad E. Torma, Socorro, N. Mex., assignor to Extraction Research & Development, Inc., Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 38,929, May 14, 1979, abandoned. This application Mar. 21, 1980, Ser. No. 132,666
Int. Cl.³ C01F *7/26*
U.S. Cl. 423—112 **1 Claim**

1. A process for extracting alumina and cement constituents from fly ash which comprises;

a. subjecting the fly ash to magnetic separation by known methods yielding an iron-bearing magnetic fraction and a nonmagnetic fraction, and

b. dry mixing the nonmagnetic fraction with a calcining agent, CaO, wherein the ratio of CaO to SiO_2 by weight is between 1.4 and 2.0, and said dry mixing yielding a dry mixture, and

c. pelletizing the dry mixture by adding a sufficient amount

of water and forming pellets which are approximately spherical, and

d. drying and calcining the pellets by subjecting the pellets to a temperature of between 900° C. and 1200° C. for between five and thirty hours and yielding calcined fly ash, and

e. acid treating the calcined fly ash, resulting in diluted slurry, and

f. selectively increasing the pH of the diluted slurry to 2.0 by the addition of lime, and

g. subjecting the diluted slurry to a filtration yielding solids and a pregnant solution, and

h. selectively subjecting the pregnant solution to a purification step using an organic solvent, yielding scrub solution and purified pregnant solution, and

i. subjecting the purified pregnant solution to evaporation, removing water and seeding the purified pregnant solution with aluminum sulfate crystals, yielding aluminum sulfate suspension, and

j. subjecting the aluminum sulfate suspension to a liquid-solid separation which yields a mother liquor and hydrated crystalline aluminum sulfate, and

k. calcining the crystalline aluminum sulfate at approximately 1000° C. which drives off the sulfur oxides and water of hydration and yields alumina.

4,242,314
PROCESS FOR SEPARATION AND RECOVERY OF COBALT BY STRIPPING

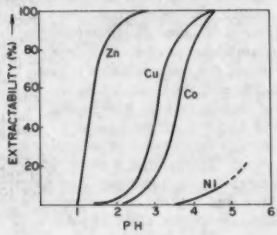
Kazuhiko Motoba, 1-4-7 Miyata-cho, and Eiji Itoh, 1-4-15 Miyata-cho, both of Hitachi-shi, Ibaragi-ken, Japan

Filed Jul. 19, 1979, Ser. No. 58,771

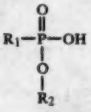
Claims priority, application Japan, Nov. 9, 1978, 53/138115; Nov. 9, 1978, 53/138116

Int. Cl.³ C01G *51/00*

U.S. Cl. 423—139 4 Claims



1. In a process for separating and recovering cobalt from an aqueous solution containing cobalt by bringing said aqueous solution into contact with an organic solvent containing a monoalkyl ester of alkylphosphonic acid represented by the formula:



wherein R_1 and R_2 may be the same or different from each other and represent an alkyl group having 8 to 10 carbon atoms to extract and separate cobalt in said aqueous solution into said organic solvent and then further bringing the resultant organic solvent containing cobalt into contact with an aqueous mineral acid solution to effect the stripping of cobalt, the improvement comprising controlling the pH of said aqueous mineral acid solution in the range of from 1.5 to 3.5 during the contact of said organic solvent with said aqueous mineral acid solution.

4,242,315
HYDRIDES OF THE FORMULA AB_nH_m

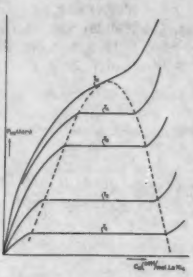
Hugo A. C. M. Bruning; Johannes H. N. van Vucht; Frans F. Westendorp, and Hinne Zijlstra, all of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 673,220, Apr. 2, 1976, abandoned, which is a continuation of Ser. No. 247,454, Apr. 25, 1972, abandoned, which is a continuation of Ser. No. 867,811, Oct. 20, 1969, abandoned. This application Apr. 10, 1978, Ser. No. 895,000

Claims priority, application Netherlands, Jan. 24, 1969, 6901276; Apr. 23, 1969, 6906305

Int. Cl.³ C01B *6/24*

U.S. Cl. 423—252 4 Claims



1. A hydride of the gross formula AB_nH_m and capable of reversible dissociation into metal plus hydrogen gas, wherein A is an element selected from the group consisting of calcium, the rare earths, and combinations of one of said elements with Th, Zr, and Hf, B is an element selected from the group consisting of Ni and Co, and combinations of said element with one of the elements Fe and Cu, n has a value lying between about 3 and about 8.5 and m has a value exceeding 0 and up to about 7.

4,242,316
SULFAMIC ACID AS A CATALYST FOR THE POLYMERIZATION OF CHLOROCYCLOPHOSPHAZENES

David P. Sinclair, Winfield, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 29, 1979, Ser. No. 53,351

Int. Cl.³ C01B *25/10*

U.S. Cl. 423—300 12 Claims

1. A process for polymerization of chlorophosphazenes to produce a $(Cl_2PN)_m$ polymer product having a controlled molecular weight and molecular weight range with controlled polydispersity in which m is 20 to 50,000 which process comprises polymerizing dichlorophosphazenes of the formula $(Cl_2PN)_n$ in which n is 3 to 7 and wherein the (Cl_2PN) moiety is present in a concentration of at least one mole per liter in the presence of between about 0.1 mmole to about 50 mmoles of a sulfamic acid compound per mole of (Cl_2PN) moiety, said sulfamic acid compound being selected from the group consisting of sulfamic acid, sulfamic acid salts and nitrogen-substituted derivatives of sulfamic acid which are N-alkyl, N-dialkyl, N-alkyl and N-aryl, N-aryl and N-diaryl, wherein the alkyl moiety is 1 to 12 carbon atoms and the aryl moiety is selected from the group consisting of phenyl, naphthyl, anthracenyl, phenanthrenyl, benzothienyl and fluorenyl moieties.

4,242,317

AMMONIA SYNTHESIS PROCESS

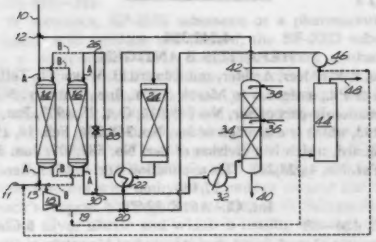
Alwyn Pinto, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 24, 1978, Ser. No. 936,402

Claims priority, application United Kingdom, Aug. 26, 1977, 35933/77; Oct. 28, 1977, 44995/77

Int. Cl.³ C01C 1/02

U.S. Cl. 423—359 7 Claims



1. An ammonia synthesis process which comprises the steps
(a) passing a mixture of nitrogen and hydrogen over an ammonia synthesis catalyst whereby to effect incomplete reaction to ammonia;
(b) cooling the reacted gas mixture;
(c) contacting the cooled gas mixture with water whereby to produce an aqueous solution of ammonia and a stream of unreacted gas containing water vapour;
(d) drying said unreacted gas by passing it through a charge of regenerable solid absorbent until said charge is loaded with water and switching the unreacted gas flow to a fresh or regenerated charge;
(e) recycling dried unreacted gas to the synthesis catalyst;
(f) maintaining circulation of gas through preceding steps (a) to (e) by means of a compressor;
(g) adding fresh synthesis gas to the circulating gas; the process being further characterized by
(i) adding said fresh synthesis gas between step (b) and step (d), whereby to remove any water vapour from it;
(ii) operating said compressor in step (f) downstream of said drying step (d) and upstream of said synthesis catalyst;
(iii) regenerating said water-loaded charge with hot ammonia-containing synthesis gas after step (a) but before step (c) whereby to displace water from it and provide the regenerated charge required in step (d); and
(iv) separating the displaced water from the gas, along with the ammonia contained therein, by cooling the gas in said step (b) and contacting the cooled gas with water in step (c).

4,242,318

PROCESS FOR THE PREPARATION OF AQUEOUS SUSPENSIONS CONTAINING AT LEAST 65% BY WEIGHT OF CALCIUM CARBONATE

Jacques Brahm, Grimbergen, and Jean-Pierre De Rath, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Jul. 10, 1978, Ser. No. 923,195

Claims priority, application Luxembourg, Jul. 11, 1977, 77723

Int. Cl.³ C01F 5/24, 11/18

U.S. Cl. 423—430 19 Claims

1. A process for the preparation of an aqueous suspension of calcium carbonate comprising:
(a) crystallizing calcium carbonate by carbonating in a dilute aqueous medium a source of calcium ions with a source of carbonate ions in the presence of a water-soluble polyelectrolyte to obtain a dilute aqueous suspension of calcium carbonate;
(b) separating a wet concentrate of calcium carbonate from the dilute aqueous suspension of calcium carbonate by essentially mechanical separating means to obtain directly a wet concentrate of calcium carbonate containing at least 65% by weight calcium carbonate; and
(c) fluidizing and homogenizing said wet concentrate in the presence of a dispersing agent to obtain an aqueous suspension of calcium carbonate containing at least 65% by weight calcium carbonate.

4,242,319

PROCESS FOR PRODUCTION OF CYANOGEN CHLORIDE

Georg Buchreiter; Peter Kniep; Kurt Scheinost, all of Trostberg, and Heinz-Rudiger Vollbrecht, Stein, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,022

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2838016

Int. Cl.³ C01B 21/088

U.S. Cl. 423—383 9 Claims

1. Process for the reaction of hydrocyanic acid with chlorine to produce cyanogen chloride and hydrochloric acid characterized by carrying out said reaction in a non-aqueous inorganic solvent reaction medium at a temperature within the range of from 0° C. to the boiling point of said solvent and at a pressure of from about 1 to 6 bars.

4,242,320

REDUCTION OF FERRIC CHLORIDE

John A. Clarke, Avonmouth, England, assignor to Mineral Process Licensing Corporation, The Hague, Netherlands

Filed May 10, 1979, Ser. No. 37,683

Claims priority, application United Kingdom, May 16, 1978, 19989/78

Int. Cl.³ C01G 94/10

U.S. Cl. 423—493 11 Claims

1. In a method for the reduction of ferric chloride in the presence of a reducing agent to produce ferrous chloride, the improvement which comprises using a reducing agent selected from the group consisting of gaseous sulphur and gaseous sulphur chlorides in which the atomic ratio of sulphur to chlorine is more than 1:1, and performing the reduction at a temperature of between about 120° C. and 650° C.

4,242,321

PROCESS FOR SEPARATING SO_2 FROM A CURRENT OF GAS CONTAINING THE SAME, AND PLANT FOR CARRYING OUT SUCH PROCESS

Volker Fattinger, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 838,708, Oct. 3, 1977, abandoned. This application Feb. 15, 1979, Ser. No. 12,262

Claims priority, application Switzerland, Jul. 21, 1977, 9063/77

Int. Cl.³ C01B 17/82

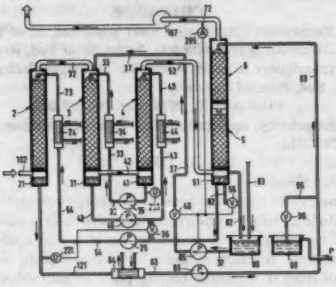
U.S. Cl. 423—523 27 Claims

1. In the production of sulfuric acid by the nitrogen oxide process conducted in a system of gas-liquid contact columns, in which process the SO_2-containing gas initially flows through a denitration zone, thereafter through a SO_2-processing zone consisting essentially of at least one packed tower, and subsequently through a nitrogen oxide absorption zone, in the course of which flow it is brought into contact in said SO_2-processing zone with dilute acid having a H_2SO_4 concentration of less than 70% by weight which acid is circulated through the last-mentioned zone, said gas flow from said SO_2-processing zone while in the absorption zone having the nitrogen oxides released into the gas flow in the denitration zone absorbed by sulfuric acid, and nitrose-containing acid having a H_2SO_4 concentration of 70 to 80% by weight is drawn off from

the absorption zone and fed into the denitration zone, the improvement which comprises

(a) measuring the content of NO in the current of gas at a point in the absorption zone or simultaneously at points both in the absorption zone and downstream thereof, and

(b) introducing a nitrogen-oxygen compound selected from the group consisting of NO, NO_2, N_2O_3, nitrose-containing sulfuric acid and nitric acid into the liquid phase of the dilute acid cycle of at least one packed tower of the SO_2-processing zone when a specific NO-content limit value of



the NO-content set to comply with the existing NO emission standard is exceeded or when the slope reflecting the rate of increase of the NO-content in the current of gas, passing through said NO control point or points defined in (a) exceeds a limit value set for said slope, while in either case said NO-content is still below said standard, said nitrogen-oxygen compound being introduced in an amount sufficient to decrease the NO-content below said first specific limit value or to decrease said slope below said slope limit value.

4,242,322

METHODS AND MATERIALS FOR DETECTING ANTIGENS AND ANTIBODIES

Sean P. O'Neill, Bethesda, Md., assignor to Electro-Nucleonics Laboratories, Inc., Bethesda, Md.

Filed Jun. 7, 1978, Ser. No. 913,508

Int. Cl.[2] G01N *33/16*; A61K *43/00, 39/00*

U.S. Cl. 424—1 **15 Claims**

1. A method for detecting the presence of antigen or antibody particles in serum which comprises

1. incubating the serum containing the antigen or antibody particles to be detected with a bifunctional immunoadsorbent characterized by the presence of a first site containing bound antibody which is complementary to the antigen particle to be detected, and a second site containing bound antigen which is complementary to the antibody particle to be detected, whereby the antigen or antibody particles present in the serum conjugates with its complementary antibody or antigen on the immunoadsorbent,

2. incubating the resulting product with labeled antigen or antibody, and

3. determining the extent to which the labeled antigen or antibody becomes bound to the said product.

4,242,323

PLAQUE INHIBITING ORAL COMPOSITION

David G. Vlock, 2 E. 65th St., New York, N.Y. 10021

Filed Aug. 22, 1979, Ser. No. 68,825

Int. Cl.[3] A61K *7/26, 9/68*

U.S. Cl. 424—58 **1 Claim**

1. In the art of inhibiting plaque accumulation on teeth by means of oral hygeine compositions containing effective plaque inhibiting amounts of either of (a) cocoa powder or (b) a flavorant selected from the group consisting of peppermint oil, spearmint oil, cinnamon oil, and mixtures thereof,

the improvement which comprises the step of employing effective plaque inhibiting amounts of a combination of (a) and (b) in oral hygeine compositions characterized by improved plaque inhibition or at least reduction in plaque formation as contrasted to the degree of plaque accumulation obtained from separate employment of either of (a) or (b).

4,242,324

HEPATITIS B ANTIGEN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 845,016, Oct. 25, 1977, Pat. No. 4,186,193, which is a division of Ser. No. 768,236, Feb. 14, 1977, abandoned, which is a division of Ser. No. 587,507, Jun. 16, 1975, Pat. No. 4,024,243. This application Apr. 4, 1979, Ser. No. 27,184

Int. Cl.[3] A61K *39/29*

U.S. Cl. 424—89 **6 Claims**

1. A complex formed by the association of positively charged sodium ions and negatively charged hepatitis B surface antigen, the complex being substantially free of other cations.

4,242,325

PHOSPHOROTRIAMIDES AS UREASE INHIBITORS

Allan V. Bayless, and Ozra E. Milliner, Jr., both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 6, 1979, Ser. No. 55,459

Int. Cl.[3] A61K *31/66*

U.S. Cl. 424—210 **1 Claim**

1. A method for controlling the enzymatic decomposition of urea to ammonia and carbonic acid due to the action of the enzyme urease thereon which consists in exposing said enzyme to an amount of a compound of the formula

$$RNHP(NH_2)_2$$

wherein R is hydrogen, phenyl, 4-nitrophenyl, 4-aminophenyl, 4-cyanophenyl or 3-trifluoromethylphenyl sufficient to inhibit said enzymatic decomposition.

4,242,326

ANTI-TUMOR SUBSTANCE AND PROCESS FOR PREPARING THE SAME

Yutaka Sugawara, Omiya; Akihiro Yamamoto, Higashiyamato; Mitsuaki Handa, Kamifukuoka; Hiroko Usami, Tokyo, and Haruki Ogawa, Chofu, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 783,270, Mar. 31, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,744

Claims priority, application Japan, Jun. 29, 1978, 53/78039

Int. Cl.[3] A61K *35/74*

U.S. Cl. 424—116 **7 Claims**

1. A substance having the following properties:

(a) appearance: from white to grayish white powder

(b) solubility: insoluble in water

(c) elemental analysis: C, 42.97%, H, 5.64%; N, 7.31%

(d) ultraviolet absorption spectrum: as shown in FIG. 1

(e) infrared absorption spectrum: as shown in FIG. 2

(f) chemical composition: rhamnose, 33.3%; hexosamine, 12.7%; protein, 16.7%; total lipid, 0.2%, RNA, none; DNA, none.

4,242,327

ANTIBIOTIC SF-2052 SUBSTANCE AND PRODUCTION AND USE THEREOF

Kazunori Ohba; Takashi Shomura, both of Yokohama; Michio Kojima; Shoji Omoto, both of Tokyo; Takashi Tsuruoka, Kawasaki, and Shigeharu Inoue, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Oct. 31, 1979, Ser. No. 89,924
Claims priority, application Japan, Nov. 6, 1978, 53-135921
Int. Cl.[3] A61K *35/00*
U.S. Cl. 424—116 6 Claims

1. A substance, SF-2052 substance or a pharmaceutically acceptable acid addition salt thereof; the SF-2052 substance being a water-soluble basic compound having antibacterial activity, and the SF-2052 substance hydrochloride being in the form of a colorless and amorphous powder which is substantially stable under neutral to acidic pH conditions but instable under alkaline pH conditions, which shows no definite melting point but discolors into brown gradually at or near 170° C. and is decomposed at 209°–210° C. with foaming, which shows positive reaction with ninhydrin, Lemieux reagent and Greig-Leiback's reagent but negative reaction with Sakaguchi's reagent and silver nitrate and which is readily soluble in water, soluble in methanol and insoluble in ethyl acetate, chloroform, benzene and ethylether;

the SF-2052 substance hydrochloride being further characterized by:

(a) exhibiting an elemental analysis: C 35.69%, H 7.04%, N 11.80%,

(b) having no characteristic absorption peak at 220 nm to 370 nm in ultraviolet absorption spectrum in aqueous solution,

(c) having an infrared absorption spectrum in potassium bromide pellet corresponding to that shown in FIG. 1 of the attached drawings,

(d) having a hydrogen nuclear magnetic resonance absorption spectrum in deutero-water substantially corresponding to that shown in FIG. 2 of the attached drawings,

(e) having a carbon nuclear magnetic resonance absorption spectrum in deutero-water substantially corresponding to that shown in FIG. 3 of the attached drawings,

(f) having a specific optical rotation $[\alpha]_D^{25} = +87°$ (c=1, water) in aqueous solution, and

(g) giving a single spot as Rf=0.46 in a cellulose thin layer chromatography with n-propanol-pyridine-acetic acid-water (15:10:3:12) as the developing solvent and at Rf=0.09 in a paper chromatography with n-butanola-cetic acid-water (2:1:1) as the developing solvent according to the ascending method.

4,242,328

PROCESS AND COMPOSITIONS

Stanley L. Hem, West Lafayette, and Joe L. White, Lafayette, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation of Ser. No. 845,198, Oct. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 566,254, Apr. 9, 1975, Pat. No. 4,059,681, which is a continuation-in-part of Ser. No. 360,043, May 14, 1973, abandoned. This application Sep. 4, 1979, Ser. No. 72,206
The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.
Int. Cl.[3] C01B *31/24;* A01N *11/00;* A61K *33/10;* C01F *7/02*
U.S. Cl. 424—157 8 Claims

1. A process for preparing a dried amorphous therapeutic antacid aluminum hydroxide gel which comprises contacting an amorphous aqueous aluminum hydroxide gel with an inert organic solvent, of sufficient solubility in water to maintain a single phase when contacted in a 1:1 volume ratio with the aqueous gel, to replace water in the gel, removing the inert organic solvent; drying the amorphous aluminum hydroxide gel to an acid reactant stable amorphous powder that is no less than about 40 weight percent aluminum oxide with said powder having an initial pH-stat t_{50} value with a range of about 6 to 20 minutes and retaining a pH-stat t_{50} time within said range for a period of at least 24 months beyond the date of drying.

4,242,329

BRADYKININ-INHIBITING TRIPEPTIDE DERIVATIVES

Karl G. Claeson, Lidingö; Leif R. Simonsson, Hisings-Backa, and Salo Arielly, Kungsbacka, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed Jul. 17, 1979, Ser. No. 58,333
Claims priority, application Sweden, Jul. 18, 1978, 7807937
Int. Cl.[3] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 24 Claims

1. Tripeptide derivatives of the formula

H-D-X-Phe-Arg-Y

in which

X is selected from the group consisting of Pro and Phe

Y is selected from the group consisting of O—R_1 and NH—R_2 in which

R_1 is selected from the group consisting of straight, branched and cyclic alkyl group with 1–12 C atoms, and

R_2 is selected from the group consisting of H, straight, branched and cyclic alkyl group with 1–12 C atoms, and physiologically acceptable salts thereof.

4,242,330

DERIVATIVE OF ASPIRIN

Anwar A. Hussain, Lexington, Ky.; James E. Truelove, Downington, Pa., and Harry B. Kostenbauder, Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed May 30, 1979, Ser. No. 43,814
Int. Cl.[3] A61K *31/70;* C07H *13/02*
U.S. Cl. 424—180 12 Claims

1. The compound 1-O-(2'-acetoxy)benzoyl-α-D-2-deoxy-glucopyranose.

2. A method for inducing an analgesic, antipyretic, antirheumatic or anti-inflammatory response in a warm-blooded animal which comprises orally administering thereto an effective amount of 1-O-(2'-acetoxy)benzoyl-α-D-2-deoxy-glucopyranose.

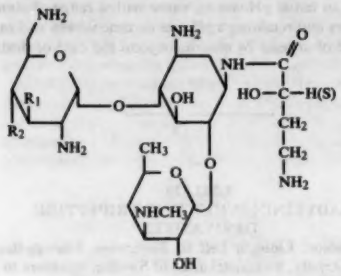
4,242,331

AMINOGLYCOSIDES AND METHOD OF USE

Jean-Claude Gasc, Bondy, and Claude Rettien, Montreuil, both of France, assignors to Roussel Uclaf, Paris, France

Filed Aug. 17, 1979, Ser. No. 67,316
Claims priority, application France, Sep. 6, 1978, 78 25604
Int. Cl.[3] A61K *31/71;* C07H *15/22*
U.S. Cl. 424—180 13 Claims

1. A compound selected from the group consisting of desoxystreptamines of the formula



I

wherein R_1 and R_2 are selected from the group consisting of hydrogen and hydroxyl with at least one of them being hydrogen and their non-toxic, pharmaceutically acceptable acid addition salts.

10. A method of treating bacterial infections in warm-blooded animals comprising administering to warm-blooded animals a bactericidally effective amount of at least one compound of claim 1.

4,242,332

4,5-METHANO-BUFADIENOLIDE-RHAMNOSIDES, THEIR PREPARATION, AND DRUGS CONTAINING THESE COMPOUNDS

Hans P. Albrecht; Gerda von Philipsborn, both of Weinheim; Hans U. Siebeneick, Ludwigshafen, and Manfred Raschack, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

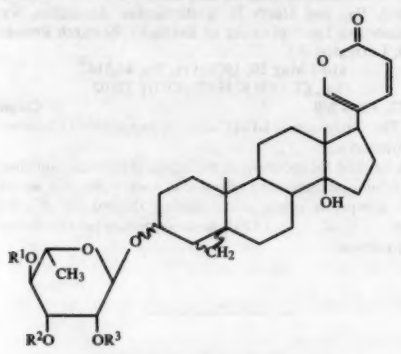
Filed Sep. 6, 1979, Ser. No. 73,107

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841074

Int. Cl.³ A61K *31/705;* **C07J** *19/00*

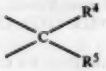
U.S. Cl. 424—182 **8 Claims**

1. A 4,5-Methano-bufadienolide-rhamnoside of the formula I



I

where R^1 is hydrogen or alkyl of 1 to 4 carbon atoms or acyl of 1 to 4 carbon atoms, and R^2 and R^3 are identical or different and each is hydrogen or alkyl of 1 to 4 carbon atoms or acyl of 1 to 4 carbon atoms, or both together are



where R^4 and R^5 are identical or different and each is hydrogen, alkyl or alkoxy of 1 or 2 carbon atoms.

8. The method of treating cardiac insufficiency in a patient suffering therefrom which consists essentially of administering either orally or intravenously to the patient a pharmaceutically acceptable composition containing an effective amount of a compound of claim 1.

4,242,333

NEMATOCIDAL UNSUBSTITUTED PHENYL ESTERS OF O-ALKYL-S-ALKYL-THIOPHOSPHORIC ACID

Denis Varsanyi, Arlesheim, and Gert Handschin, Reinach, both of Switzerland, assignors to Vsesoyuznii Na'uchno-Isledova Telskii Gustitut Khimichesti Institute, U.S.S.R.

Continuation of Ser. No. 746,689, Dec. 2, 1976, abandoned, which is a continuation of Ser. No. 652.865, Jan. 27, 1976, abandoned, which is a division of Ser. No. 445,011, Feb. 22, 1974, abandoned, which is a continuation of Ser. No. 273,075, Jul. 19, 1972, abandoned. This application Mar. 22, 1978, Ser. No. 888,942

Claims priority, application Switzerland, Jul. 23, 1971, 10883/71

Int. Cl.³ A01N *57/00*

U.S. Cl. 424—225 **2 Claims**

1. A nematocidal composition comprising a nematocidally effective amount of O-ethyl-S-n-propyl-O-phenylthiophosphate in admixture with a diluent.

4,242,334

CORTICOID 17-(ALKYL CARBONATES) AND PROCESSES FOR THEIR PREPARATION

Ulrich Stache, Hofheim am Taunus; Werner Fritsch, Bad Soden am Taunus, and Hans G. Alpermann, Königstein all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

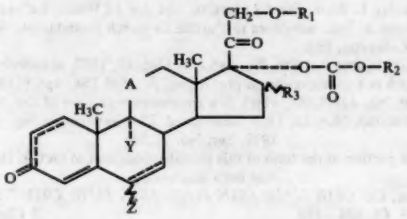
Filed Aug. 2, 1978, Ser. No. 930,194

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735110

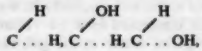
Int. Cl.³ A61K *31/56;* **C07J** *7/00*

U.S. Cl. 424—243 **22 Claims**

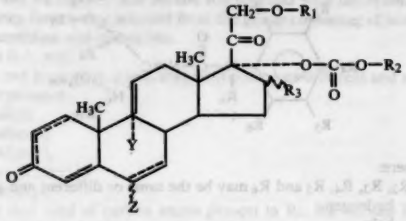
1. A compound selected from the group consisting of compounds of the formula



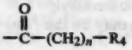
wherein A is



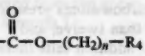
or C═O, and compounds of the formula



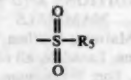
wherein
Y is hydrogen, fluorine, or chlorine;
Z is hydrogen, chlorine, fluorine, or methyl;
R_3 is hydrogen, fluorine, α-methyl, monofluoromethyl, or difluoromethyl;
R_2 is alkyl having 1 to 8 carbon atoms; and
R_1 is acyl of the formula



wherein R_4 is hydrogen, alkyl having 1 to 10 carbon atoms, or cycloalkyl having 3 to 8 carbon atoms and n is a number from 0 to 4, or
R_1 is carbonyloxyalkyl of the formula



wherein n is 0 or 1 and R_4 is as earlier defined except that R_4 is other than hydrogen when n is 0, or R_1 is



wherein R_5 is alkyl having 1 to 4 carbon atoms, phenyl, methylphenyl, ethylphenyl, fluorophenyl, bromophenyl, or chlorophenyl.

14. The method of treating inflammatory dermatosis in a human or animal suffering therefrom which method comprises locally or topically administering an effective amount of a compound as in claim **1**.

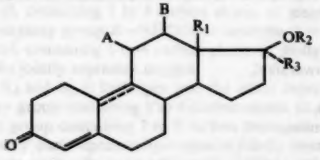
4,242,335

NOVEL 17α-ARYL-STEROIDS

Geneviéve Azadian, Paris; Daniel Philibert, La Varenne Saint-Hilaire, and André Pierdet, Noisy-le-Sec, all of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 27, 1978, Ser. No. 955,403
Claims priority, application France, Nov. 8, 1977, 77 33557
Int. Cl.³ C07J *1/00*
U.S. Cl. 424—243 **32 Claims**

1. A compound of the formula



wherein R_1 is alkyl of 1 to 3 carbon atoms, R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms and acyl of an organic carboxylic acid of 1 to 18 carbon atoms, R_3 is selected from the group consisting of phenyl and naphthyl optionally substituted with at least one substituent selected from the group consisting of —OH, halogen, alkoxy and alkyl of 1 to 4 carbon atoms and $—CF_3$, the dotted line in the B ring indicating an optional double bond in the 9(10) position, and A and B are hydrogen and when there is a double bond in the 9(10) position, A and B form a double bond in the 11(12) position or B is hydrogen and A is an 11β-hydroxy.

21. A method of inducing progestomimetic activity in warm-blooded animals without androgenic activity comprising administering to warm-blooded animals a progestomimetically effective amount of at least one compound of claim **1**.

4,242,336

ANTIBACTERIAL AND ANTIFUNGAL COMPOSITION

Masayasu Hasegawa, Kyoto; Hideo Nishikawa, Ibaraki, and Kayoko Yoshida, Takatsuki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1979, Ser. No. 58,446
Claims priority, application Japan, Jul. 31, 1978, 53-93878; Aug. 2, 1978, 53-94785
Int. Cl.³ A01N *43/02, 43/40, 43/88, 55/02*
U.S. Cl. 424—246 **2 Claims**

1. An antibacterial and antifungal composition comprising a mixture of:
(A) at least one member selected from the group consisting of dehydroacetic acid, and its alkali metal salts, wherein said member is contained within said composition in an amount from 60%–95% by weight, based on the total weight of the composition, and
(B) tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione in a synergistically effective amount of 0.5% to 40% by weight based on the weight of the total composition.

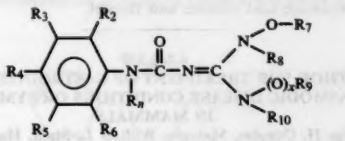
4,242,337

METHOD FOR TREATMENT OF DIARRHEAL DISEASE CONDITIONS OR SYMPTONS IN MAMMALS

George H. Douglas, Malvern; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 934,780, Aug. 18, 1978, which is a division of Ser. No. 811,092, Jun. 17, 1977, Pat. No. 4,115,647, which is a division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557.
This application Jan. 8, 1979, Ser. No. 1,638
Int. Cl.² A61K *31/535, 31/445, 31/42, 31/17*
U.S. Cl. 424—248.54 **17 Claims**

1. The method of treatment of diarrhea in a mammal comprising administering thereto between 0.1 mg/kg. and 150 mg/kg. of an effective dose of a compound of the formula:



where:
R_2, R_3, R_4, R_5 and R_6 may be the same or different and are: hydrogen, halo, loweralkyl, haloloweralkyl, nitro, amino, acylamino, hydroxy, aralkyloxy or loweralkoxy,
R_n is hydrogen or loweralkyl;
R_7, R_8, R_9 and R_{10} may be the same or different and are: hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl or aralkyl;
x is 0–1;
the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than twelve; and
the non-toxic acid addition salts thereof.

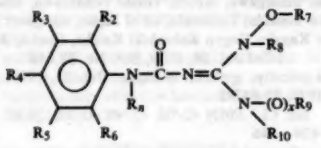
4,242,338

METHOD FOR TREATMENT OF GASTROINTESTINAL SECRETORY AND ULCEROGENIC DISEASE CONDITIONS OR SYMPTOMS IN MAMMALS

George H. Douglas, Malvern; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 934,780, Aug. 18, 1978, which is a division of Ser. No. 811,092, Jun. 17, 1977, Pat. No. 4,115,647, which is a division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557.
This application Jan. 8, 1979, Ser. No. 1,668
Int. Cl.[2] A61K *51/535, 31/42*
U.S. Cl. 424—248.54 8 Claims

1. The method for the treatment of gastrointestinal hypersecretion and ulceration in a mammal comprising administering thereto between 0.1 mg/kg. and 150 mg/kg. of an effective dose of a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl,
halologweralkyl,
nitro,
amino,
acylamino,
hydroxy,
aralkyloxy or
loweralkoxy;

R_n is hydrogen or loweralkyl;

R_7 and R_8 together and R_9 and R_{10} together with the N and O may form a ring selected from the group consisting of isooxazolidine and isooxazine;

x is 0–1; and

R_9 and R_{10}, when x is 0, may be the same or different and are:
hydrogen,
alkyl,
alkenyl,
alkynyl,
cycloalkyl or
aralkyl;

the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than twelve; and

the non-toxic acid addition salts thereof.

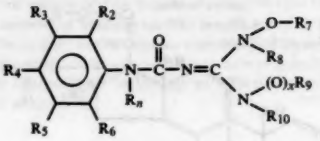
4,242,339

METHOD FOR TREATMENT OF GASTROINTESTINAL SPASMODIC DISEASE CONDITIONS OR SYMPTOMS IN MAMMALS

George H. Douglas, Malvern; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 934,780, Aug. 18, 1978, which is a division of Ser. No. 811,092, Jun. 17, 1977, Pat. No. 4,115,647, which is a division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557.
This application Jan. 8, 1979, Ser. No. 1,636
Int. Cl.[2] A61K *31/535, 31/445, 31/42, 31/17*
U.S. Cl. 424—248.54 5 Claims

1. The method for the treatment of gastrointestinal spasms in a mammal comprising administering thereto between 0.1 mg/kg. and 150 mg/kg. of an effective dose of a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl,
halologweralkyl,
nitro,
amino,
acylamino,
hydroxy,
aralkyloxy or
loweralkoxy;

R_n is hydrogen or loweralkyl;

R_7, R_8, R_9 and R_{10} may be the same or different and are:
hydrogen,
alkyl,
alkenyl,
alkynyl,
cycloalkyl or
aralkyl;

x is 0–1;

the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than twelve; and

the non-toxic acid addition salts thereof.

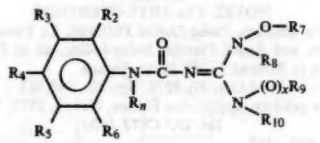
4,242,340

METHOD FOR THE TREATMENT OF DIARRHEAL DISEASE CONDITIONS AND SYMPTOMS IN MAMMALS

George H. Douglas, Malvern; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 934,780, Aug. 18, 1978, which is a division of Ser. No. 811,092, Jun. 17, 1977, Pat. No. 4,115,647, which is a division of Ser. No. 671,763, Mar. 30, 1976, Pat. No. 4,058,557.
This application Jan. 8, 1979, Ser. No. 1,639
Int. Cl.[2] A61K *31/535, 31/42*
U.S. Cl. 424—248 54 9 Claims

1. The method of treatment of diarrhea in a mammal comprising administering thereto between 0.1 mg/kg. and 150 mg/kg. of an effective dose of a compound of the formula:



where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are:
hydrogen,
halo,
loweralkyl,
halologweralkyl,
nitro,
amino,
acylamino,
hydroxy,
aralkyloxy or
loweralkoxy;

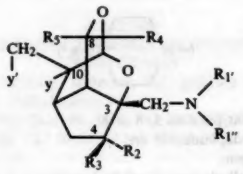
R_n is hydrogen or loweralkyl;
R_7 and R_8 together and R_9 and R_{10} together with the N and O may form a ring selected from the group consisting of isooxazolidine and isooxazine;
x is 0–1; and
R_9 and R_{10}, when x is 0, may be the same or different and are:
hydrogen,
alkyl,
alkenyl,
alkynyl,
cycloalkyl or
aralkyl;
the sum total of carbon atoms present in R_7, R_8, R_9 and R_{10} together is less than twelve; and
the non-toxic acid addition salts thereof.

4,242,341
2,9-DIOXATRICYCLO [4,3,1,$0^{3,7}$] DECANE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Peter W. Thies, Hanover; Akiji Asai, Wennigsen, and Samuell David, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 904,742, May 11, 1978, which is a division of Ser. No. 770,055, Feb. 18, 1977, Pat. No. 4,163,055. This application Sep. 14, 1979, Ser. No. 75,706
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, P2607106
Int. Cl.³ A61K *31/495, 31/535;* **C07D** *405/06, 413/06*
U.S. Cl. 424—248.55 **10 Claims**

1. A compound selected from the group of 2,9-dioxatricyclo [4,3,1,$0^{3,7}$] decanes of formula I



wherein R_1, and $R_{1''}$ together with the nitrogen atom to which they are bound form a cyclic amino group selected from the group consisting of indolinyl and groups of the formula

wherein A represents oxygen or a group >N-A′ wherein A′ represents an alkyl group containing 1 to 4 carbon atoms which is unsubstituted or substituted in ω-position by a substituent which is selected from the group consisting of hydroxy, acyloxy, carbamyloxy, pyridyl, or a phenyl or benzhydryl group, the phenyl rings of which are unsubstituted or substituted by halogen;
one of R_2 and R_3 is hydrogen and the other represents hydroxy, an acyloxy group Z—COO— wherein Z is alkyl or alkenyl, containing 1 to 4 carbon atoms, or phenyl, or a carbamyloxy group Z—NHCOO— wherein Z is alkyl or alkenyl, containing 1 to 4 carbon atoms or phenyl, or R_2 and R_3 jointly represent oxygen;
one of R_4 and R_5 is hydrogen and the other represents an alkoxy group containing 1 to 6 carbon atoms, or an aralkyloxy group containing 7 to 9 carbon atoms;
and y and y′ each represent hydrogen or jointly form a bond;
and pharmaceutically acceptable acid addition salts thereof.

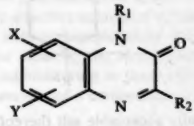
6. A pharmaceutical composition comprising an inert carrier material and a sedatively or saporifically effective amount of a compound as defined in claim 1.

4,242,342
QUINOXALINONES USEFUL FOR TREATING ATOPIC ECZEMA AND URTICARIA

Charles M. Hall, and Herbert G. Johnson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 940,815, Sep. 11, 1978, Pat. No. 4,181,724.
This application May 31, 1979, Ser. No. 44,031
Int. Cl.³ A61K *31/495*
U.S. Cl. 424—250 **1 Claim**

1. A method for treating atopic eczema or urticaria in a mammal in need of said treatment which comprises administering to said mammal an effective amount of a compound of the formula



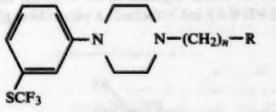
wherein
X and Y are the same or different and are hydrogen, fluoro, chloro, bromo, nitro, trifluoromethyl, alkyl of one to four carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, or cyano;
R_1 is hydrogen, methyl or ethyl,
R_2 is hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl, benzyl,
CH_2Z wherein Z is fluoro, chloro or bromo,
CO_2M, CH_2CO_2M, $CH_2CH_2CO_2$ M or CHR_3CO_2M wherein M is hydrogen, alkyl of one to four carbon atoms, inclusive, or a physiologically acceptable metal or amine cation and R_3 is alkyl of one to three carbon atoms, inclusive, with the proviso that M is not hydrogen when R_2 is CH_2CO_2M or CHR_3CO_2M; in association with a pharmaceutical carrier.

4,242,343
PHENYLPIPERAZINE DERIVATIVES

Henry Najer, Paris, and Philippe Manoury, Le Plessis-Robinson, both of France, assignors to Synthelabo, Paris, France

Filed Jun. 15, 1979, Ser. No. 48,814
Claims priority, application France, Jun. 20, 1978, 78 18351
Int. Cl.³ A61K *31/495;* **C07D** *405/06, 295/08*
U.S. Cl. 424—250 **5 Claims**

1. Phenylpiperazine derivatives corresponding to the formula (I)



in which n is 1,2 or 3 and R represents the tetrahydrofuryl-2 radical, or the radical CH_2-SH, or a radical CH_2-S-alkyl, or a radical CH_2-O-alkyl or a radical CH_2-S-CO-alkyl, the alkyls having from 1 to 8 carbon atoms,
and also their addition salts with pharmaceutically acceptable acids.

5. A pharmaceutical composition which contains a compound as specified in claim 1 in an effective tranquilizing dosage.

4,242,344

PIPERAZINYL-IMIDAZO[1,2-A]PYRAZINES

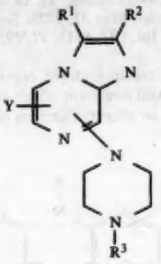
William C. Lumma, Pennsburg, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 4,970, Jan. 22, 1979. This application Sep. 7, 1979, Ser. No. 73,574

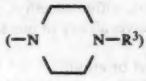
Int. Cl.[3] A61K *31/495;* C07D *401/14, 403/14*

U.S. Cl. 424—251 9 Claims

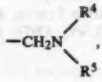
1. A compound of the structural formula:



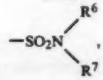
or a pharmaceutically acceptable salt thereof, wherein:
the piperazinyl group



and Y are at positions 5, 6 or 8;
R^1 and R^2 independently ar
(a) hydrogen;
(b) lower alkyl;
(c) lower cycloalkyl;
(d) lower alkylthio;
(e) halo;
(f) $-CF_3$;
(g) CF_3S-;
(h) C_6H_5-;
(i) phenyl-substituted by halogen;
(j) phenyl-substituted by C_{1-3} alkyl;
(k) phenyl-substituted by C_{1-3} alkoxy;
(l)

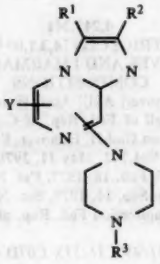


wherein R^4 is hydrogen or C_{1-6} alkyl; R^5 is C_{1-6} alkyl; or R^4 and R^5 taken together form with the nitrogen atom to which they are attached, a piperidino group;
(m)

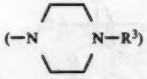


wherein R^6 and R^7 are independently hydrogen, C_{1-3} alkyl, or phenyl; or
R^1 and R^2 joined together form $-CH_2CH_2CH_2-$ or $-CH_2CH_2CH_2CH_2-$;
R^3 is
(a) hydrogen;
(b) lower alkyl;
(c) lower(cycloalkyl-alkyl);
(d) lower cycloalkyl; or
(e) lower alkanoyl;
Y is
(a) hydrogen;
(b) halo;
(c) —C≡N;
(d) $-CF_3$;
(e) lower alkyl
(f) lower alkoxy; or
(g) —COOH.

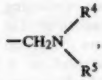
7. A method of decreasing appetite, which comprises the administration to a mammalian species in need of such treatment an effective amount of a compound of formula:



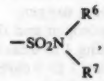
or a pharmaceutically acceptable salt thereof, wherein:
the piperazinyl group



and Y are at positins 5, 6 or 8;
R^1 and R^2 independently are
(a) hydrogen;
(b) lower alkyl;
(c) lower cycloalkyl;
(d) lower alkylthio;
(e) halo;
(f) $-CF_3$;
(g) CF_3S-;
(h) C_6H_5-;
(i) phenyl-substituted by halogen;
(j) phenyl-substituted by C_{1-3} alkyl;
(k) phenyl-substituted by C_{1-3} alkoxy;
(l)



wherein R^4 is hydrogen or C_{1-6} alkyl; R^5 is C_{1-6} alkyl; or R^4 and R^5 taken together form with the nitrogen atom to which they are attached, a piperidino group;
(m)



wherein R^6 and R^7 are independently hydrogen, C_{1-3} alkyl, or phenyl; or

R^1 and R^2 joined together form $—CH_2CH_2CH_2—$ or $—CH_2CH_2CH_2CH_2—$;

R^3 is

(a) hydrogen;
(b) lower alkyl;
(c) lower(cycloalkyl-alkyl);
(d) lower cycloalkyl; or
(e) lower alkanoyl;

Y is

(a) hydrogen;
(b) halo;
(c) —C≡N;
(d) $—CF_3$;
(e) lower alkyl;
(f) lower alkoxy; or
(g) —COOH.

4,242,345
7-(OXOALKYL)-1,3-DIALKYL XANTHINES, AND MEDICAMENTS CONTAINING THEM

Gunther Brenner, Erkrath-Unterbach; Joachim Goring; Eskendar Ali Khan; Oskar Rohte, and Manfred Tauscher, all of Gronau, Fed. Rep. of Germany, assignors to Johann A. Wulfing, Fed. Rep. of Germany

Continuation of Ser. No. 753,931, Dec. 23, 1976, abandoned, which is a continuation of Ser. No. 542,449, Jan. 20, 1975, abandoned. This application Sep. 19, 1978, Ser. No. 943,815

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1974, 2402908

Int. Cl.³ C07D *473/06*

U.S. Cl. 424—253 **29 Claims**

1. 7-(3-Oxobutyl)-1,3-di-n-butyl xanthine.

4,242,346
BIS-2N-ALKYLENE TETRAHYDROISOQUINOLINE COMPOUNDS

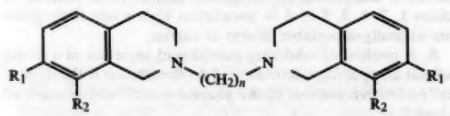
Robert M. DeMarinis, Ardmore, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Dec. 19, 1979, Ser. No. 105,359

Int. Cl.³ A61K *31/47*; C07D *401/06*

U.S. Cl. 424—258 **12 Claims**

1. A chemical compound of the formula:



in which:

R_1 is chloro or sulfamyl; R_2 is chloro and, provided that R_1 is sulfamyl, R_2 is also hydrogen, and n is a positive integer from 1 to 8, or a pharmaceutically acceptable acid addition salt thereof.

8. A pharmaceutical composition in dosage unit form for inhibiting phenylethanolamine N-methyltransferase comprising a pharmaceutical carrier and a chemical compound as defined in claim 1.

4,242,347
HYPOTENSIVE INDOLYLALKYLPIPERIDYL GUANIDINES AND ISOUREAS

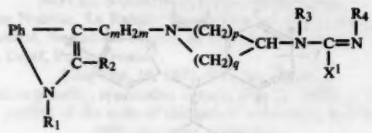
Charles F. Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 556,600, Mar. 10, 1975, abandoned. This application Jun. 18, 1979, Ser. No. 50,003

Int. Cl.³ A61K *31/445*; C07D *401/06, 491/056*

U.S. Cl. 424—267 **3 Claims**

1. A compound of the formula



wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one member selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy having 1 or 2 carbon atoms, benzyloxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro and amino; each of R_1, R_2, R_3 and R_4 is hydrogen or lower alkyl; X' is O-lower alkyl, S-lower alkyl, NH_2 or NH-lower-alkyl; m is an integer from 1 to 7; each of p and q is an integer from 1 to 3, but $(p+q)=4$; or a therapeutically acceptable acid addition salt thereof.

2. A hypotensive pharmaceutical composition comprising a pharmacologically effective amount of a compound claimed in claim 1, together with a pharmaceutical excipient.

3. A method for reducing the blood pressure in mammals, which comprises administering to them enterally or parenterally an effective amount of a composition claimed in claim 2.

4,242,348
NOVEL BASIC SUBSTITUTED-ALKYLIDENAMINO-OXYLALKYL-CARBOXYLIC-ACID ESTERS

Jan van Dijk, and Johannes M. A. Zwagemakers, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation of Ser. No. 801,030, May 27, 1977, abandoned, which is a division of Ser. No. 509,807, Sep. 27, 1974, Pat. No. 4,044,023, which is a division of Ser. No. 151,793, Jun. 10, 1971, Pat. No. 3,853,955. This application Dec. 26, 1978, Ser. No. 972,845

Claims priority, application Netherlands, Jun. 11, 1970, 7008493; Mar. 2, 1971, 7102715

Int. Cl.³ C07D *221/04, 211/40*

U.S. Cl. 424—267 **10 Claims**

1. A compound selected from the group consisting of [[(4-chloro-α-methylbenzylidene) amino]-oxy-] acetic acid (2-pentamethylene-imino-ethyl)ester, [[(4-chloro-α-methylbenzylidene)-amino]-oxy] -acetic acid [2-(3, 4-benzopiperidyl) (ethyl] ester, [[-4-chloro-α-methylbenzylidene) amino]-oxy]-acetic acid (N-ethyl-piperidyl-4)ester, [[(4-chloro-α-methylbenzylidene) amino]-oxy]-acetic acid (4-N-dimethylpiperidyl-4) ester, [[(4-chloro-α-methyl-enzylidene) amino]-oxy] - acetic acid (piperidyl-3-ester, [[(4-chloro-α-methylbenzylidene) amino] -oxy]-acetic acid-(2-pyrrolidyl-ethyl) ester and [[(4-chloro-α-methylbenzylidene) mino]-oxy] -acetic acid) N ethyl-piperidyl-3 ester and salts thereof with pharmaceutically acceptable acids.

4,242,349
OREXIGENIC USE OF PYRROLO[2,1-b][3]BENZAZEPINES

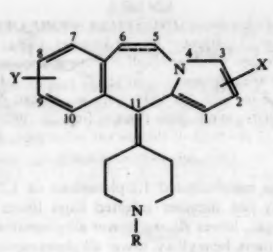
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1979, Ser. No. 80,813

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **5 Claims**

1. A method of stimulating appetite comprising administering to a patient in need of such treatment an effective appetite stimulating amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein the dotted line represents saturation or unsaturation; X and Y are independently hydrogen halogen, lower alkyl, or lower alkoxy; and R is lower alkyl.

4,242,350

ANTISECRETORY THIADIAZOLE DERIVATIVES, PROCESSES FOR THEIR MANUFACTURE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Tobias O. Yellin, Wallingford, Pa., and Derrick M. Mant, Bramhall, England, assignors to Imperial Chemical Industries Limited, London, England and ICI Americas Inc., Wilmington, Del.

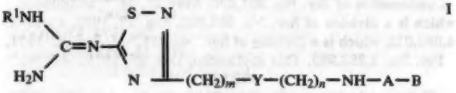
Filed May 7, 1979, Ser. No. 36,360

Claims priority, application United Kingdom, May 24, 1978, 21737/78

Int. Cl.[3] **A61K** *31/425;* **C07D** *285/08*

U.S. Cl. 424—270 **20 Claims**

1. A thiadiazole derivative of the following formula I:



wherein

Y is an oxygen or sulphur atom, a direct bond or a methylene or sulphinyl radical;

m is 0 to 4;

n is 1 to 4;

provided that when Y is a sulphur or oxygen atom or a sulphinyl radical m is 1 to 4, and when Y is an oxygen atom or a sulphinyl radical, n is 2 to 4;

R^1 is a hydrogen atom or an alkyl radical of 1 to 10 carbon atoms;

A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is an oxygen or sulphur atom or Z is a radical of the formula NCN, NNO_2, $CHNO_2$, $NCONH_2$, $C(CN)_2$, $NCOR^2$, NCO_2R^2, NSO_2R^2, or NR^3 in which R^2 is an alkyl radical of 1 to 6 carbon atoms or an aryl radical of 6 to 12 carbon atoms and R^3 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms; and

B is an alkoxy or alkylthio radical of 1 to 6 carbon atoms or a radical of the formula NR^4R^5 in which R^4 and R^5, which may be the same or different, are hydrogen atoms, alkyl radicals of 1 to 10 carbon atoms, alkenyl or alkynyl radicals of 3 to 6 carbon atoms in which the double or triple bond respectively is separated from the nitrogen atom of NR^4R^5 by at least one carbon atom, (primary hydroxy)alkyl or (primary amino)alkyl radicals of 2 to 6 carbon atoms or cycloalkyl radicals of 3 to 6 carbon atoms, or R^4 and R^5 are joined to form, together with the nitrogen atom to which they are attached, a 5- or 6-membered saturated ring which optionally contains an additional oxygen atom or NH radical; and the pharmaceutically-acceptable acid-addition salts thereof.

10. A pharmaceutical composition for inhibiting acid secretion comprising an effective amount of the thiadiazole derivative as claimed in claim **1**, **2**, **3**, **4**, **5**, **6**, **7** or **8** in association with a non-toxic pharmaceutically-acceptable diluent or carrier.

4,242,351

ANTISECRETORY OXADIAZOLES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

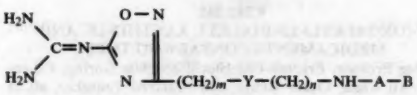
Tobias O. Yellin, Wallingford, Pa., and Derrick M. Mant, Bramhall, England, assignors to Imperial Chemical Industries Limited, London, England and ICI Americas Inc., Wilmington, Del.

Filed May 7, 1979, Ser. No. 36,361

Int. Cl.[3] **C07D** *271/06;* **A61K** *31/42*

U.S. Cl. 424—272 **9 Claims**

1. An oxadiazole derivative of the following formula I:



wherein

Y is an oxygen or sulphur atom, a direct bond or a methylene radical;

m is 0 to 4;

n is 1 to 4;

provided that when Y is a sulphur or oxygen atom m is 1 to 4, and when Y is an oxygen atom n is 2 to 4;

A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is an oxygen or sulphur atom or Z is a radical of the formula NCN, NNO_2, $CHNO_2$, $NCONH_2$, $C(CN)_2$, $NCOR^1$, NCO_2R^1, NSO_2R^1 or NR^2 in which R^1 is an alkyl radical of 1 to 6 carbon atoms or an aryl radical of 6 to 12 carbon atoms and R^2 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms; and

B is an alkoxy or alkylthio radical of 1 to 6 carbon atoms or a radical of the formula NHR^3 in which R^3 is a hydrogen atom or an alkyl radical of 1 to 10 carbon atoms;

and the pharmaceutically-acceptable acid-addition salts thereof.

7. A pharmaceutical composition to inhibit gastric acid secretion comprising an oxadiazole derivative as claimed in claim **1**, **2**, **3**, **4**, **5** or **6** in association with a non-toxic pharmaceutically-acceptable diluent or carrier.

9. A method of inhibiting gastric acid secretion in a living animal comprising administering to the animal a therapeutically effective amount of the pharmaceutical composition of claim 7.

4,242,352

3-AMINO-5-BENZYL-1,2,4-OXADIAZOLES AND ANTI-HYPERTENSIVE COMPOSITIONS THEREOF

Michael J. Dimsdale, Villebon sur Yvette, France, assignor to Synthelabo, Paris, France

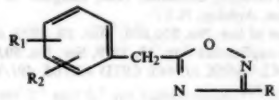
Division of Ser. No. 922,527, Jul. 7, 1978. This application Apr. 27, 1979, Ser. No. 34,197

Claims priority, application France, Jul. 12, 1977, 77 21447; Jun. 8, 1978, 78 17114

Int. Cl.[3] **C07D** *271/06;* **A61K** *31/41*

U.S. Cl. 424—272 **5 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are each independently a halogen atom or alkyl of 1 to 4 carbon atoms, and R is NR_3R_4 in which R_3 and R_4 are each independently a hydrogen atom or alkyl of 1 to 4 carbon atoms or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical preparation in dosage unit form which comprises an anti-hypertensively effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,242,353

ANALGESIC POTENTIATION

Joseph F. Gardocki, Doylestown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

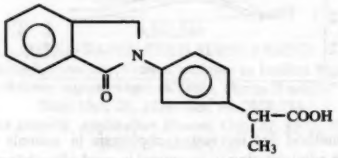
Filed Dec. 18, 1978, Ser. No. 970,511

Int. Cl.[2] A61K *31/40, 31/19*

U.S. Cl. 424—274 **8 Claims**

5. A method for producing analgesia which comprises orally administering to a subject suffering from pain

(1) as primary antinociceptive agent from about 0.17 to 2.5 mg/kg of body weight of a 4-(1,3-dihydro-1-oxo-2H-isoindol-2-yl)-α-methylbenzeneacetic acid compound, said compound being selected from (a) 4-(1,3-dihydro-1-oxo-2H-isoindol-2-yl)-α-methylbenzeneacetic acid represented by the formula



and (b) the non-toxic therapeutically acceptable salts thereof, and

(2) as potentiating agent from about 2.2 to 7.5 mg/kg of body weight of acetaminophen.

4,242,354

2-(2-THENOLYTHIO)-PROPIONYLGLYCINE: METHOD FOR ITS PREPARATION AND PHARMACEUTICAL FORMULATIONS CONTAINING SAID COMPOUND

Franco Bolasco, Rome, Italy, assignor to Mediolanum Farmaceutici s.r.l., Milan, Italy

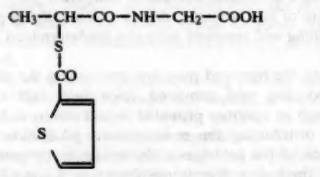
Filed Apr. 4, 1979, Ser. No. 26,933

Claims priority, application Italy, Apr. 11, 1978, 22175 A/78; Feb. 12, 1979, 20111 A/79

Int. Cl.[2] A01N *9/00;* **C07D** *333/24*

U.S. Cl. 424—275 **5 Claims**

1. 2-(2-thenoylthio)-propionylglycine as a new compound, characterized by the structural formula (I)



(I)

as well as its pharmacologically acceptable salts.

4,242,355

NOVEL 3-(AMINOETHYL)-PHENOLS

Lucien Nedelec, Le Raincy; Daniel Frechet, Paris, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 17, 1979, Ser. No. 76,486

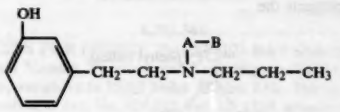
Claims priority, application France, Sep. 22, 1978, 78 27190

The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.

Int. Cl.[3] A61K *31/38, 31/135;* **C07D** *333/16;* **C07C** *87/29*

U.S. Cl. 424—275 **17 Claims**

1. A compound selected from the group consisting of 3-(aminoethyl)-phenols of the formula



wherein A is a simple bond or alkylene of 1 to 6 carbon atoms and B is selected from the group consisting of phenyl, and thienyl with the proviso that B is not phenyl when A is ethylene and their non-toxic, pharmaceutically acceptable acid addition salts.

4,242,356

ANTIBACTERIAL AND ANTIFUNGAL COMPOSITION

Masayasu Hasegawa, Kyoto; Hideo Nishikawa, Ibaraki, and Yasuo Kotani, Hirakata, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 18, 1979, Ser. No. 58,448

Claims priority, application Japan, Dec. 26, 1978, 53-161816; Dec. 26, 1978, 53-161817; Dec. 26, 1978, 53-161818; Dec. 26, 1978, 53-161819; Dec. 26, 1978, 53-161820; Dec. 26, 1978, 53-161821; Dec. 26, 1978, 53-161822

Int. Cl.[3] A01N *31/08, 37/34, 43/02, 43/36*

U.S. Cl. 424—279 **2 Claims**

1. An antibacterial and antifungal composition comprising a mixture of:

(A) at least one member selected from the group consisting of dehydroacetic acid, and its alkali metal salts, wherein said member is contained within said composition in an amount 60–95% by weight, based on the total weight of the composition, and

(B) tetrachloroisophthalonitrile in a synergistically effective amount of from 1% to 40% by weight based on the total weight of the composition.

4,242,357

CARBOXYLIC ACID ESTERS FOR COMBATING PESTS

Rainer A. Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

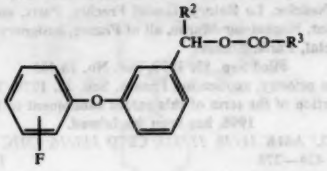
Filed Mar. 31, 1977, Ser. No. 783,503

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615435; May 14, 1976, 2621433

Int. Cl.[2] A01N *9/20;* **C07C** *69/76, 121/66;* **C07D** *317/60*

U.S. Cl. 424—282 **7 Claims**

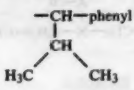
1. A 3-phenoxybenzyl alcohol carboxylic acid ester of the formula



in which

R^2 represents hydrogen cyano or ethynyl and

R^3 represents the



wherein the phenyl ring can optionally carry one or more substituents selected independently from halogen, alkyl, alkylthio and alkoxy with in each case 1 to 4 carbon atoms, nitro and methylenedioxy.

6. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,242,358

METHOD OF TREATMENT OF ALGIAE

Bernard Majoie, Dijon, France, assignor to Societe de Recherches Industrielles (Sori), Paris, France

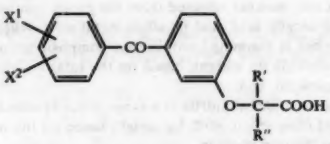
Filed Jan. 24, 1979, Ser. No. 6,105

Int. Cl.³ A61K *31/19*; C07C *127/15*

U.S. Cl. 424—317 **15 Claims**

1. A method of treatment of algiae which comprises administering to a patient in need of such a treatment an effective antalgic amount of a compound selected from the group consisting of

(i) m-benzoyl-phenoxyalkylcarboxylic acids of the formula



(I)

wherein X^1 and X^2 are the same or different and are each H, CH_3, OCH_3, F, Cl, Br or CF_3, and R′ and R″ are the same or different and are each H or CH_3; and,

(ii) non-toxic metallic salts thereof.

4,242,359

SPERMICIDAL AGENTS

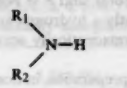
George W. Cooper, New York, N.Y., and Ronald J. Young, Stamford, Conn., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 783,622, Apr. 1, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,332

Int. Cl.³ A61K *31/13*

U.S. Cl. 424—325 **11 Claims**

1. A method for killing mammalian spermatozoa, which comprises contacting spermatozoa with a spermicidally effective amount of an amphipathic organic amine of the formula (I)



(I)

wherein R_1 represents hydrogen, and R_2 represents an alkyl-, cycloalkyl- or cycloalkylalkyl-group containing 3 to 7 carbon atoms.

4,242,360

CHOLERETIC PHARMACEUTICAL COMPOSITIONS AND METHOD OF TREATMENT

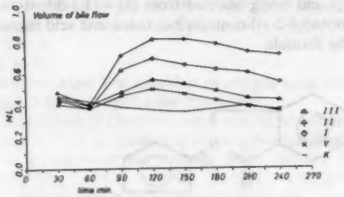
Mathias Paller, Vienna, Austria, and Roland Wagner, Bergisch-Gladbach, Fed. Rep. of Germany, assignors to Rowa Limited, Cork, Ireland

Filed Dec. 20, 1978, Ser. No. 971,403

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757641

Int. Cl.³ A61K *31/045*

U.S. Cl. 424—343 **3 Claims**



1. A method for increasing choleresis in animals which comprises administering to an animal in need of such treatment a cholereticly effective amount of cis-3,3,5-trimethylcyclohexanol.

4,242,361

PREPARATION OF SAUERKRAUT

Charles Christ, Connerre; Jean-Michel Lebeault, Villiers, and Claude Noel, Compriegne, all of France, assignors to Marc-Roger Hirsch, Paris, France

Filed Aug. 17, 1977, Ser. No. 825,487

Claims priority, application France, Oct. 14, 1976, 76 30874; May 31, 1977, 77 16465

Int. Cl.³ A23B *7/10*

U.S. Cl. 426—49 **5 Claims**

1. In a process for fermenting cabbage to produce sauerkraut, comprising the steps of placing salt and the cabbage in a container and closing the upper end of said container with an airtight cover, fermenting said cabbage in an active fermentation phase wherein carbon dioxide is evolved, a neutral fermentation phase and a final acidifying fermentation phase, the improvement comprising the steps of:

removing a controlled amount of sauerkraut juice from the bottom of said container during said acidifying phase;

maintaining said removed juice at a predetermined temperature;

analyzing the removed juice and controlling the pH;

re-introducing said removed juice into said container through an aperture provided in said cover; and

evenly distributing the re-introduced juice over the top surface of the cabbage in the container by passing said juice through a porous membrane or a sieve-like plate provided with holes disposed above the top surface of said cabbage.

4,242,362

PROCESS FOR MANUFACTURING CHEESE

Charles O. Grigsby, and David R. Grigsby, both of 751 N. Jackson, Rte. 107, Pittsfield, Ill. 62363

Filed Jul. 27, 1978, Ser. No. 928,386
Int. Cl.[3] A23C *19/02*
U.S. Cl. 426—40 24 Claims

1. In the process of manufacturing cheese having eyes formed therein including the steps of clarifying milk to remove sediment, standardizing the clarified milk to a uniform fat content in the range of about 2.5 to about 3.5 percent, setting the milk with a suitable composition of innoculants and coagulants to form a curd, cutting the curd, cooking the cut curd at a temperature of about 100° to about 135° F. until it acquires the desired characteristics, separating the curd from the whey, hooping the curd to shape it into the desired form, alternatively pressing and turning the curd to remove holes or cavities formed therein, salting the curd in a salt brine solution for about 2 to 4 days at a temperature of about 50° to about 60° F., and curing the curd for about 60 days to about 6 months to produce cheese having eyes formed therein, wherein the improvement comprises carrying out said pressing of the curd for about 2 to 4 hours at a temperature of about 80° to 130° F., said salting of the curd being carried out in a super saturated salt brine solution in excess of about 85% salinity reading for about 30 minutes to about 4 hours at a temperature of about 80° to about 130° F., said curing of the curd being effected by aging the cheese for about 6 to about 24 hours, and thereafter force drying the cheese using high velocity air at a temperature of about 90° to about 300° F. for about 1 to about 60 minutes.

4,242,363

UREA-BASED FEED SUPPLEMENT

Bueno Lionel, Aussonne, France, assignor to Institut National de la Recherche Agronomique (INRA), Paris, France

Filed Oct. 26, 1978, Ser. No. 954,774
Claims priority, application France, Oct. 27, 1977, 77 32842
Int. Cl.[3] A23K *1/22*
U.S. Cl. 426—69 3 Claims

1. A feedstuff supplement for admixture with a feedstuff for herbivorous animals comprising urea or a derivative thereof as a source of nutritive nitrogen and approximately 5 to 100 milligrams of orotic acid per gram of non-protein nitrogen in said urea or derivative.

4,242,364

DRY POWDERED NON-DAIRY FOOD COMPOSITION CONTAINING LIQUID FAT

Bruce D. Buddemeyer; William A. Neville; James S. Taylor, and Richard G. Bourne, all of Kansas City, Mo., assignors to R.G.B. Laboratories, Inc., Kansas City, Mo.

Filed Dec. 19, 1978, Ser. No. 970,938
Int. Cl.[3] A23C *11/02*
U.S. Cl. 426—98 17 Claims

1. A dried, solid, liquid fat-containing coffee whitener or liquid dairy product replacement food particle, comprising:

a particle of fat having a diameter of no more than about 3 microns, said fat being flowable at about room temperature; and

an encapsulating matrix around said fat particle including at least one emulsifier and a carbohydrate material with a D.E. ranging from 10 to 70 selected from the group consisting of corn syrup, wheat syrup, sorghum syrup, the maltodextrins of the aforementioned syrups, and mixtures thereof,

a plurality of said food particles having stability such that:

A. a 25% by volume dispersion thereof in water, when stored at 40° F. for 72 hours, exhibits no more than about 20% fat-water phase separation;

B. a quantity of said particles sufficient to provide a total of about 0.36 grams of fat, when dispersed in 50 mls. of black coffee at 175° F., gives a relative reflectance of at least 50%, using an Agtron Model M-500A reflectometer standardized in the red spectral mode, 640 m.u., with a 00 calibration disc for zero and a 44 calibration disc for 100% relative reflectance;

C. three grams of said food particles added to 150 mls. of 175° F. black coffee in a container having a 5 cm. diameter, followed by gentle stirring and allowing the mixture to stand for two minutes, exhibits no more than about 10 oil droplets on the surface of the mixture; and

D. taking the mixture derived from test (C) hereof, and allowing the same to stand for an additional 3 minutes, the mixture exhibits essentially no precipitation or flocculation, and no more than a moderate amount of feathering.

4,242,365

PROCESS FOR PRODUCING FRIED BANANA SLICES

Masayuki Numata, Fujisawa, and Kenji Sagano, Tokyo, both of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 924,012, Jul. 11, 1978, abandoned. This application Sep. 12, 1979, Ser. No. 74,622
Claims priority, application Japan, Jul. 11, 1977, 52-81934
Int. Cl.[3] A23L *1/212*
U.S. Cl. 426—438 2 Claims

1. A process for producing a dried banana product, which comprises;

frying slices of about 1 to 5 mmm thickness of fully ripe raw banana flesh in an edible oil as rapidly as possible, but within 20 minutes after slicing, without a prior treatment with a browning inhibitor, while substantially maintaining a pressure of about 30 to about 60 Torr and a frying temperature of about 75° to about 85° C. to dehydrate the slices;

separating the banana slices from the frying oil while still maintaining a reduced pressure of about 30 to about 60 Torr;

removing the excess frying oil adhering to the banana slices while still maintaining a pressure of about 30 to about 60 Torr; and

thereafter releasing the reduced pressure to return the pressure to atmospheric pressure.

4,242,366

EMULSIFIER SYSTEM AND CAKE MIX CONTAINING SAME

Jay E. Morgan, Eden Prairie; Anthony J. DelVecchio, Minneapolis; Betty L. Brooking, Golden Valley, and David M. Laverty, Plymouth, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Oct. 24, 1978, Ser. No. 954,145
Int. Cl.[3] A21D *2/16, 10/00*
U.S. Cl. 426—554 13 Claims

1. A blend of commercial food grade emulsifiers suitable for use in a dry prepared mix, said blend comprising an admixture of three separate functional emulsifying components consisting essentially of 45–68% propylene glycol monoester, 20–39% alpha monoglyceride and 9–22% glyceryl lacto ester.

4,242,367

MILK SHAKE AND SOFT SERVE FROZEN DESSERT STABILIZER

Robert S. Igoe, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 26, 1979, Ser. No. 6,611
Int. Cl.[3] A23L *1/04;* A23G *9/00*
U.S. Cl. 426—573 2 Claims

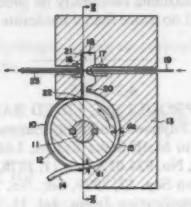
1. A stabilizer blend of gums for use in milk shakes and soft serve frozen milk desserts which consists essentially of by weight:

Guar gum: 53–68%
Xanthan gum: 20–35%
Carrageenan: 9–13%
Locust Bean gum: 0–5%

4,242,368
METHOD FOR THE MANUFACTURE OF A COMPOSITE METAL WIRE

Masahiro Nagai, and Yasuhiko Miyake, both of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Apr. 25, 1978, Ser. No. 899,968
Claims priority, application Japan, Apr. 30, 1977, 52/50076
Int. Cl.[2] C23C 17/00
U.S. Cl. 427—11 8 Claims



1. A method of manufacturing a composite metal wire including a metal core wire surrounded by a coating metal of a material different from said metal core wire, said method comprising:

providing a rotary wheel having therein a peripheral groove;

providing a fixed shoe block having a fitting surface cooperating with a circumferential portion of said groove to define therewith a narrow passageway having an inlet end and an outlet end, a fixed stopper portion fitting in said groove to entirely close said passageway and to define said outlet end thereof, and a covering chamber communicating with said outlet end of said passageway and having a nipple for guiding a metal core wire and a die for defining the outer cross-section of a composite metal wire;

feeding coating metal into said inlet end of said passageway, while rotating said rotary wheel in a direction toward said outlet end of said passageway;

subjecting said coating metal within said passageway to plastic deformation due to oppositely directed frictional forces including a greater friction force from the surfaces of said wheel defining said groove and a lesser friction force from said fitting surface of said fixed shoe block;

positively carrying said coating metal through said passageway by said greater friction force and causing said coating metal to collide with said fixed stopper portion, thereby imparting an extrusion pressure to said coating metal;

passing a metal core wire into said nipple and through said covering chamber; and

due to said extrusion pressure, passing said coating metal into said chamber, thus filling said chamber with said coating metal, covering said metal core wire with said coating metal to form a bond therebetween, and extruding through said die said metal core wire covered with said coating metal as a composite metal wire.

4,242,369
PLATING OF SUBSTRATES BY JET PRINTING

Ishwar R. Mansukhani, Neenah, Wis., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Jun. 7, 1977, Ser. No. 804,469
Int. Cl.[2] B05D 3/14
U.S. Cl. 427—47 13 Claims

1. A process for the plating of substrates by the jet printing of a metal or alloy which comprises continuously imprinting minute uniform droplets of a jet printing ink containing at least one soluble salt of at least one plate metal which is more nobel than said basis metal, said jet printing ink exhibiting a viscosity at 68° F. of between about 1.5 and 16 cps., said ink having a pH of between 0.5 and 9.5 and a specific resistivity of less than 10,000 ohm cm., onto a substrate, said droplets emitting from at least one ink jet electromagnetically energized to emit said droplets of ink at a rate of 8 to 150 kilohertz.

9. The process for plating onto the surface of a basis metal which comprises printing said basis metal first with a jet printing ink containing a soluble metal salt of a metal more noble than said basis metal, said basis metal having an activated surface; subsequently jet printing said basis metal having said activated surface thereon with a jet printing ink containing:

(1) metal ions in substantially the same concentration as in said first jet printing ink and in addition thereto,

(2) ions of an auxiliary plate metal not present in said first jet printing ink.

13. The process for plating onto the surface of an aluminum basis metal which comprises jet printing said aluminum basis metal with an activating jet printing ink containing a soluble salt of a metal more noble than aluminum and being essentially free of active copper ions; subsequently jet printing said aluminum having said activating surface thereon with a second jet printing ink containing:

(1) a soluble stannate in substantially the same concentration as in said activating jet printing ink and in addition thereto,

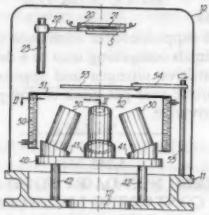
(2) ions of copper;

to obtain a plate containing tin and copper.

4,242,370
METHOD OF MANUFACTURING THIN FILM ELECTROLUMINESCENT DEVICES

Mohamed I. Abdalla, 39, Rue de l'Amiral Mouchez, Paris, France (75013), and Jacques A. Thomas, 22, Avenue Victor Hugo, Bagneux, France (92220)

Filed Apr. 6, 1979, Ser. No. 27,597
Claims priority, application France, Mar. 17, 1978, 78 07807
Int. Cl.[3] B44D 1/18, 1/16
U.S. Cl. 427—66 2 Claims



1. A method of manufacturing a zinc sulfide thin film electroluminescent sandwich device activated by copper metal and by manganese metal comprising:

placing a glass substrate in a bell jar at a top portion thereof;

said glass substrate having an electrically conducting coating;

placing an electrical heater over said substrate in said bell jar;

placing first, second, third and fourth ovens holding elemental zinc, sulpher, manganese and copper respectively in said bell jar below said substrate and at a lower portion of said bell jar;

each said first, second, third and fourth ovens being provided with apertures at each top portion to direct vapors from each oven to said substrate above;

each said oven being provided with heating means to raise the temperature to vaporization of the elements therein and with cooling means to lower the temperature and thereby permit separate evaporation of the elements in the bell jar for deposition on said substrate under evacuation;

a plate supporting said four ovens sysmeterically about a central axis which is perpendicular to the center of the substrate;

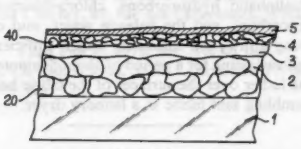
evacuating means to evacuate the bell jar and its contents under pumping vacuum down to 5×10^{-6} torr;
heating said substrate by means of said heater to a temperature of approximately 400° C.;
heating said oven containing zinc to about 550° C.;
heating said oven containing sulphur from about 100° C.; to 200° C.;
heating said oven contain-ng manganese to about 970° C.;
heating said oven containing copper to about 1010° C. for about ⅔ of the heating time and then up to about 1080° C. for the remaining time;
the foregoing heating steps being conducted simultaneously for a time of about 20 minutes under the aforesaid vacuum pumping;
stopping all vaporization except that from the sulphur to provide a sulphur rich atmosphere in said bell jar and oven to permit recrystallization of the zinc sulfide film deposited on said substrate; and
maintaining the substrate in the sulphur rich atmospher for about 60 minutes after which the coated substrate is removed for attachment of a counter-electrode.

4,242,371

HIGH-LUMINANCE COLOR SCREEN FOR CATHODE-RAY TUBES AND THE METHOD FOR MANUFACTURING THE SAME

Jean-Pierre Galves, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 808,831, Jun. 22, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,171
Claims priority, application France, Jun. 25, 1976, 76 19460
Int. Cl.[2] B05D *1/36, 3/02;* H01J *29/18*
U.S. Cl. 427—68 **3 Claims**



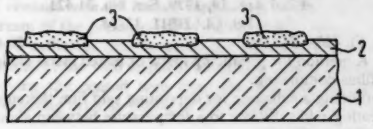
1. A method of producing luminescent screens for cathode ray tubes having two layers of phosphors separated by a layer of inert material that does not emit light under the impact of electrons comprising the steps of:
(a) depositing on a transparent glass support member, a first layer of phosphor crystals;
(b) depositing on said first phosphor layer a temporary layer of organic material;
(c) depositing on said temporary organic layer a layer of inert material;
(d) depositing on said inert layer a second layer of phosphor crystals; and then
(e) heating in vacuum said screen to burn off said temporary organic layer; and
(f) depositing a conductive thin layer on said second phosphor.

4,242,372

PROCESS FOR PRODUCING CONDUCTIVE/NON-CONDUCTIVE ADHESION LAYERS FOR LUMINESCENT MATERIALS ON FLAT/UNI-DIRECTIONALLY BENT SUBSTRATES FOR IMAGE DISPLAY DEVICES

Manfred Kobale, Faistenhaar, and Rolf Wengert, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 30, 1979, Ser. No. 7,840
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1978, 2804494
Int. Cl.[3] H01J *9/227*
U.S. Cl. 427—68 **12 Claims**



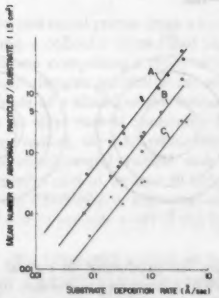
1. A process of producing adhering luminescent layers on flat or uni-directionally bent screen substrates of a color picture screen and image display screen, comprising:
coating a surface of said screen substrate with an adhesive liquid layer comprised of an alcoholic solution of oxygen-rich organic materials selected from the group consisting of silicon salts of relatively low molecular weight carboxylic acids, tin salts of relatively low molecular weight carboxylic acids and mixtures thereof;
at least partially drying said adhesive layer at a maximum temperature of about 150° C;
applying a layer of luminescent material onto said partially dried layer; and
tempering both of said layers at a maximum temperature of about 500° C.

4,242,373

METHOD FOR VAPOR DEPOSITING A CERIUM OXIDE FILM

Kiyoshi Watanabe; Kazuo Sunahara, and Tsutomu Fujita, all of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 768,755, Feb. 15, 1977, abandoned. This application May 30, 1978, Ser. No. 910,344
Claims priority, application Japan, Feb. 20, 1976, 51/17080; Feb. 20, 1976, 51/17081; Fed. Rep. of Germany, Feb. 17, 1977, 2706896; France, Feb. 18, 1977, 77 04857; Netherlands, Feb. 18, 1977, 7701757; United Kingdom, Feb. 18, 1977, 6971/77
Int. Cl.[3] B05D *1/00;* H01J *31/26*
U.S. Cl. 427—74 **5 Claims**



1. A method for vapor depositing a thin film of cerium oxide on a substrate comprising the steps of:

loading commercially available particulate or sintered cerium oxide including particles of 3μ or less in a vapor deposition boat; and

heating said cerium oxide under a predetermined vacuum to cause the cerium oxide to disperse for forming said thin film on said substrate with the deposition rate of the cerium oxide being set between 0.01 Å/sec and 0.6 Å/sec.

4,242,374

PROCESS FOR THIN FILM DEPOSITION OF METAL AND MIXED METAL CHALCOGENIDES DISPLAYING SEMI-CONDUCTOR PROPERTIES

Joseph L. Sansregret, Fords, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 19, 1979, Ser. No. 31,421
Int. Cl.³ H01L *31/18*
U.S. Cl. 427—76 **20 Claims**

1. A method for producing metal or mixed metal chalcogenide films comprising:

providing a substrate for depositing said film thereupon;

heating said substrate to a temperature between about 400° C. and 500° C.;

providing a solution of at least one salt of a metal selected from the group consisting of iron copper, nickel, cobalt, cadmium, zinc, molybdenum, or mixtures thereof in a mixture of water and a water soluble hydrocarbon;

atomizing said solution;

contacting said heated substrate with said atomized solution in an oxygen containing ambient to form an adherent film comprising an oxide of said metal or metals;

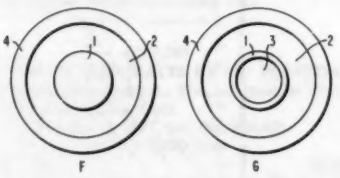
annealing said oxide film at a temperature from about 300° C. to about 400° C. in the presence of a gaseous chalcogen comprising sulfur, selenium, tellurium, or a mixture thereof, capable of undergoing an ion exchange with said oxide film, for a period sufficient to form an adherent film of a chalcogenide compound of said metal or metals.

4,242,375

PROCESS FOR PRODUCING OPTICAL TRANSMISSION FIBER

Satoshi Shiraishi; Kunio Fujiwara, and Shiro Kurosaki, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 648,997, Jan. 14, 1976, Pat. No. 4,161,505, which is a division of Ser. No. 419,011, Nov. 26, 1973, abandoned, Ser. No. 648,998, Jan. 14, 1976, which is a continuation of Ser. No. 419,011, , and Ser. No. 826,572, Aug. 22, 1977, Pat. No. 4,165,152, which is a division of Ser. No. 648,998, , Pat. No. 4,082,420. This application Aug. 3, 1978, Ser. No. 930,841
Claims priority, application Japan, Nov. 25, 1972, 47/118345; Nov. 25, 1972, 47/118346
Int. Cl.³ B05D *5/06*
U.S. Cl. 427—163 **32 Claims**



1. A process for producing an optical transmission fiber comprising feeding highly pure halides, hydrides or organic compounds of Si and B using a carrier gas, and oxidizing said halides, hydrides or organic compounds to form doped fused silica containing B_2O_3 and depositing said doped fused silica containing B_2O_3 as a layer on a rod or pipe of pure fused silica and then depositing a fused silica or water-repellent glass layer on said doped fused silica layer containing B_2O_3 and melting and spinning said rod or pipe having said layers deposited thereon into a fiber.

4,242,376

METHOD FOR METAL PLATING OF POWDER BY SUBSTITUTION

Yoshio Kawasumi, Urawa, and Mitsuo Takahashi, Tokyo, both of Japan, assignors to Nihon Kogyo Kabushika Kaisha, Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,434
Claims priority, application Japan, Oct. 18, 1978, 53-127322
Int. Cl.³ B44D *1/22*
U.S. Cl. 427—216 **8 Claims**

1. A method for plating a powder with a metal by substitution, which comprises adding a crystalline powder of a metal chloride hydrate, wherein the metal of said metal chloride hydrate is a metal having a negative standard electrode potential, after and/or during mixing a powder to be plated and a reducing metal powder, and after the initiation of the reaction, adding water and/or hydrochloric acid.

4,242,377

FABRIC CONDITIONING

Karl H. Roberts, Flemington; Marvin Liebowitz, Edison, and Henry P. Furgal, Bernardsville, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 109,691, Jan. 25, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,303
Int. Cl.² B05D *3/12*
U.S. Cl. 427—242 **28 Claims**

1. A method of conditioning fabrics which comprises applying to a fabric a pressurized composition consisting essentially of

(1) from about 0.5 to 15% by weight of a surface active conditioning agent selected from the group consisting of higher fatty acid soaps, cationic, amphoteric, nonionic and anionic compounds,

(2) from about 0.5 to 15% by weight of a foaming agent selected from the group consisting of anionic and nonionic detergents,

(3) from 10 to 79% by weight of normally gaseous propellant selected from the group consisting of aliphatic and cycloaliphatic hydrocarbons, chloro-fluorocarbons and fluorocarbons, and the balance water, said composition forming a firm, self-sustaining lather, sufficiently firm to be self sustaining for a period of about 5 minutes spreading of the lather over the surfaces of the fabric being effected by tumbling said fabric in a laundry dryer.

4,242,378

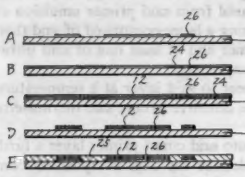
METHOD OF MAKING A DECORATED FILM WITH A METAL LAYER IN THE FORM OF A GIVEN PATTERN

Yoshiaki Arai, Kyoto, Japan, assignor to Reiko Co., Ltd., Kyoto, Japan

Filed Mar. 29, 1979, Ser. No. 25,054
Int. Cl.³ B05D *1/36, 3/00, 5/00*; B44C *1/22*
U.S. Cl. 427—264 **1 Claim**

1. In a method of making a decorated film with a metal layer in the form of a given pattern and comprising the steps of depositing a metal layer on at least one surface of a water-resistant base sheet by vacuum plating technique and removing a preselected area of said metal layer from said base sheet, the improvement comprising: printing a patterned water-insoluble colored coating composition on said surface; printing a patterned water-soluble resin on the resultant printed surface in such a manner that the printed pattern of said water-soluble resin is jig-saw matched with the printed pattern of said water-insoluble colored coating composition; depositing said metal

layer on the entire resultant double-printed surface; and immersing the resultant metal-coated material in water to dissolve said water-soluble resin and concurrently remove the metal deposited on said water-soluble resin.



4,242,379

ACID INHIBITOR TREATMENT OF SUBSTRATE PRIOR TO AUTODEPOSITION

Wilbur S. Hall, Plymouth Meeting, and Harry M. Leister, Ambler, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 917,634, Jun. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 755,919, Dec. 30, 1976, abandoned. This application Jul. 10, 1979, Ser. No. 55,974

Int. Cl.³ A23F *3/34*

U.S. Cl. 427—327 **10 Claims**

1. In a coating process wherein an autodeposited coating is formed on a worked or roughened metal surface by contacting said surface with an autodepositing composition comprising an acidic aqueous solution containing dissolved fluoride and ferric ions and having resin solids dispersed therein and wherein the coatings formed from said composition tend to contain defects, the improvement comprising treating said metal surface with an anodic acid inhibitor in an amount sufficient to passivate the anodic sites in the worked or roughened areas of said metal surface, said inhibitor not forming a detectable coating on said surface, prior to contacting said surface with said acidic coating composition.

4,242,380

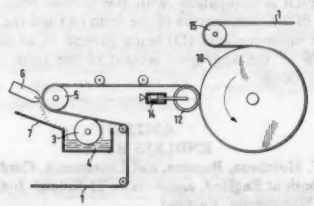
IMPROVEMENTS IN AND RELATING TO TREATMENT OF NON-WOVEN FABRIC IN ORDER TO IMPROVE THE PROPERTIES THEREOF

Jean-Francois Courtoy, 49, rue des Charretiers, Wiltz, Luxembourg

Filed Jun. 6, 1979, Ser. No. 46,186

Int. Cl.³ B05D *3/02, 3/12, 1/28;* B32B *27/00*

U.S. Cl. 427—366 **4 Claims**



1. A process for the impregnation of non-woven fabric with a plastisol comprising the steps of:

selecting the viscosity of a liquid plastisol so that it has a Newtonian viscosity in the range of 6 to 15 poise;

maintaining the selected plastisol in liquid form at a temperature in the range of 5° to 50° C.;

coating a moving web of non-woven fabric with the liquid plastisol;

heating a rotating cylinder such that it has a surface temperature in the range of between 130° and 180° C.;

urging the plastisol coated non-woven fabric web against the heated cylinder by means of a resilient pressure roll having a diameter which is smaller than the diameter of the heated cylinder to cause the plastisol to impregnate the fabric;

maintaining the plastisol impregnated non-woven fabric web in contact with the heated surface of the cylinder downstream of the pressure roll in the direction of web travel for a sufficient time to cause the plastisol to gel to the surface of the web disposed away from the cylinder; and

removing the coated web from the cylinder for further processing prior to fusing of the plastisol.

4,242,381

METHOD OF PROVIDING A POLYCARBONATE ARTICLE WITH A UNIFORM AND DURABLE SILICA FILLED ORGANOPOLYSILOXANE COATING

John C. Goossens, Mt. Vernon, Ind., and Daniel R. Olson, Clifton Park, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 18, 1979, Ser. No. 31,127

Int. Cl.³ A23F *3/00;* B32B *27/36*

U.S. Cl. 427—387 **28 Claims**

1. A method for producing a polycarbonate article having improved mar, abrasion, scratch and chemical solvent resistance and possessing enhanced ultraviolet light stability comprising:

(i) applying onto a polycarbonate substrate a primer emulsion composition consisting essentially of a thermosettable acrylic polymer, (b) at least one ultraviolet light screening compound selected from the class consisting of benzylidene malonates and cyanoacrylates, (c) from about 20 to about 40 weight percent of a hydroxy ether or alkanol containing from 1 to 4 carbon atoms, and (d) water;

(ii) evaporating off a substantial portion of said water and hydroxy ether or alkanol from said primer emulsion composition thereby forming a layer of comprised of said thermosettable acrylic polymer and at least one of said ultraviolet light screening compounds;

(iii) applying heat to said layer at a temperature and for a period of time effective to cure said thermosettable acrylic polymer;

(iv) applying onto said cured primer layer a top coat composition containing a colloidal silica filled further curable organopolysiloxane comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $R^6Si(OH)_3$ wherein R^6 is an alkyl radical containing 1 to 3 carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical and the gamma-methacryloxypropyl radical, at least 70 weight percent of said silanol being $CH_3Si(OH)_3$, said composition containing sufficient acid to provide a pH in the range of 3.0 to 6.0;

(v) evaporating off a substantial portion of the volatile solvents from said top coat composition thereby forming a layer comprised of a colloidal silica filled partial condensate of said silanol; and,

(vi) thermally curing said colloidal silica filled partial condensate of said silanol.

4,242,382

PRODUCTION OF MODIFIED CONJUGATE FIBRE PRODUCTS

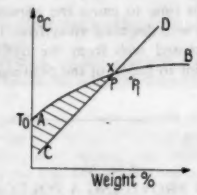
Vincent S. Ellis, and Kazimierz W. Mieszkis, both of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 607,947, Aug. 26, 1975, abandoned, which is a division of Ser. No. 351,612, Apr. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 297,392, Oct. 13, 1972, abandoned. This application May 26, 1978, Ser. No. 909,820

Claims priority, application United Kingdom, May 12, 1973, 11803/73

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—379 **6 Claims**



1. A method of modifying a conjugate fibre product containing a plurality of melt spun conjugate fibres each composed of at least two fibre-forming polymer components arranged in distinct zones across the cross-section of the fibre and substantially continuous along the length thereof, one of the components having a melting temperature significantly lower than the melting temperature of the other component and being located so as to form at least a peripheral surface of the fibre, said method comprising:

(a) applying a predetermined amount of particles of average size less than one micron substantially uniformly to a conjugate fibre product composed of said fibres by treating the product in a liquid in which the particles are dispersed:

(b) removing excess liquid and drying the product so as to leave the product in a dry, open, substantially tensionless condition; and

(c) heating the product in said condition at a non-sticking temperature for 2 to 40 minutes so as to cause substantially the whole of said particles to penetrate and become virtually completely adsorbed into the lower melting component, the non-sticking temperature lying within the Area AXCA of FIG. 2, but above the temperature To and at least 1° C. below the curve AB, to product a clean, non stuck, modified, conjugate fibre product.

4,242,383

METHOD OF PROVIDING A POLYCARBONATE ARTICLE WITH A UNIFORM AND DURABLE ORGANOPOLYSILOXANE COATING

John C. Goossens, Mt. Vernon, Ind., and Daniel R. Olson, Clifton Park, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 18, 1979, Ser. No. 31,130

Int. Cl.[3] A23F *3/00*; B32B *27/36*

U.S. Cl. 427—387 **28 Claims**

1. A method for producing a polycarbonate article having improved mar, abrasion, scratch and chemical solvent resistance and possessing enhanced ultraviolet light stability comprising:

(i) applying onto a polycarbonate substrate a primer emulsion composition consisting essentially of (a) a thermosettable acrylic polymer, (b) at least one ultraviolet light screening compound selected from the class consisting of benzylidene malonates and cyanoacrylates, (c) from about 20 to about 40 weight percent of a hydroxy ether or an alkanol containing from 1 to 4 carbon atoms, and (d) water;

(ii) evaporating off a substantial portion of said hydroxy ether or alkanol from said primer emulsion composition thereby forming a layer comprised of said thermosettable acrylic polymer and at least one of said ultraviolet light screening compounds;

(iii) applying heat to said layer at a temperature and for a period of time effective to cure said thermosettable acrylic polymer;

(iv) applying onto said cured primer layer a further-curable organopolysiloxane top coat composition containing the partial hydrolysis and condensation product of an alkyltrialkoxy silane;

(v) evaporating off a substantial portion of the volatile solvents from said top coat composition thereby forming a layer comprised of the partial hydrolysis and condensation product of said alkyltrialkoxy silane; and,

(vi) thermally curing said partial hydrolysis and condensation product of said alkyltrialkoxy silane.

4,242,384

SPRAY COATING OF ACRYLIC RESIN COMPRISING POLYMERIC MICROPARTICLES

Malcolm S. Andrew, Hazlemere, and Alan J. Backhouse, South Ascot, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 7, 1978, Ser. No. 922,847

Claims priority, application United Kingdom, May 17, 1978, 20096/78

Int. Cl.[2] B05D *1/02*

U.S. Cl. 427—421 **10 Claims**

1. A process for the production of a surface coating upon a substrate which comprises (i) applying by spray to the substrate surface a composition comprising (A) a film-forming acrylic resin which is derived from one or more alkyl esters of acrylic acid or methacrylic acid, (B) a volatile organic liquid diluent in which the polymer (A) is carried, and (C) a pigment, other than a metallic flake pigment, which is dispersed in the combination of the film-forming resin (A) and the diluent (B), and (ii) subsequently evaporating the volatile diluent to form a polymer film upon the surface, characterised in that the composition applied to the substrate further comprises (D) microparticles having a diameter of from 0.01 to 10 microns composed of a polymer which has a glass-liquid transition temperature greater than 0° C., and which are insoluble in and stably dispersed in the combination of the resin (A) and the diluent (B), the microparticles being obtained by (a) polymerisation of monomer in an inert liquid in which the resulting polymer is insoluble and under conditions such that the polymer is obtained in a state of stable dispersion and (b) subsequent polymerisation, in the same inert liquid and in the presence of the particles formed in stage (a), of ethylenically unsaturated monomer giving rise to a second acrylic polymer or copolymer which is compatible with the acrylic resin (A) and is soluble in the combination of the resin (A) and the diluent (B), and the microparticles (D) being present in an amount of at least 3% of the aggregate weight of the resin (A) and the microparticles.

4,242,385

ENDLESS BANDS

Keith F. Hutcheon, Beeston, and Laurence A. Cordingley, Lenton, both of England, assignors to TI Raleigh Industries Limited, Nottingham, England

Filed Oct. 7, 1977, Ser. No. 840,364

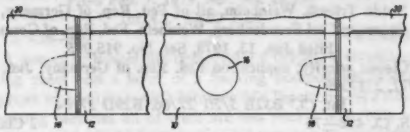
Claims priority, application United Kingdom, Oct. 9, 1976, 42074/76

Int. Cl.[3] B60R *13/00*; B32B *27/14*

U.S. Cl. 428—31 **6 Claims**

1. An endless rim tape band for a bicycle wheel comprising two superimposed strips of flexible plastics material each hav-

ing a length substantially equal to half the circumference of the wheel and wherein the length of each of said strips is substantially greater than the width of said strips, said strips welded to



each other at respective ends of the strips along a weld line transverse to the length of the strips, and means defining a hole in at least one of the strips for accommodating a valve associated with the bicycle wheel.

4,242,386

MULTIPLE GLAZING UNITS

Tilman L. Weinlich, Samerberg, Fed. Rep. of Germany, assignor to Christel Konrad, Samerberg, Fed. Rep. of Germany

Filed Nov. 28, 1978, Ser. No. 964,390

Int. Cl.³ B05D *5/00*; B32B *17/10*

U.S. Cl. 428—34 **26 Claims**

1. A method of stretching at least one film located between two panes of a glazing unit comprising the steps of:

(a) providing at least two frame portions to form a full frame;

(b) providing the frame portions with mutually confronting profiled surfaces;

(c) securing a film to one of the frame portions;

(d) assembling the individual frame portions to form the full frame, and

(e) pressing-together the frame portions to stretch the film by the coaction of the confronting profiled surface of the second frame portion against the confronting profiled surface of the one frame portion.

7. A multiple glazing unit comprising

(a) at least two panes;

(b) a frame having at least two frame portions;

(c) mutually confronting profiled surfaces on the frame portions, and

(d) at least one film which is secured to one of said frame portions so as to extend between and be substantially parallel to the panes, and said film stretched between the frame portions upon the pulling action of the confronting profiled surfaces on the film when assembling and pressing together the frame portions.

4,242,387

WRAPAROUND DEVICE

George G. Ward, 2 Coventry La., Lincolnshire, Ill. 60015

Filed Nov. 24, 1978, Ser. No. 963,449

Int. Cl.³ B32B *3/30, 1/02, 1/08*

U.S. Cl. 428—35 **12 Claims**

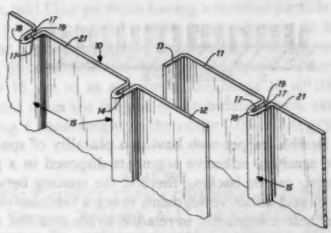
9. A wraparound device to be manipulated into tubular form and adapted to be placed in encircling relation about a member, and comprising:

a lightweight thin self-sustaining plastic panel of a material which has a substantially common thickness of about 0.020 to 0.040 inch through the extent of the panel and is resiliently flexible across its plane so that the panel can be bent into tubular form;

said panel having opposite margins which are adapted to be brought together in the tubular form of the panel;

means along said opposite margins for securing the panel from a substantially flat condition into tubular form;

said panel having at predetermned spaced intervals and extending entirely thereacross between and parallel to said margins a plurality of ribs comprising indentations projecting from the face of the panel which is at the inside in the tubular form and said ribs having walls defining



grooves of substantial depth which open from the face of the panel which is at the outside of the tubular form, and the grooves extending throughout the length of the ribs and having open ends at opposite edges of said panel and which edges extend between and normal to said margins;

and the ribs serving as resilient expansion hinges by spreading open and affording resilient flexibility in direction across said ribs and between said margins, so that the ribbed panel is at least partially expansile in direction across said ribs and between said margins throughout the extent of the panel in the tubular form, whereby to be adaptable for a range of variable diametrical dimensions in members wrapped by the device, even though the material of the panel is of itself resistant to yielding in its plane.

4,242,388

SEALING CEMENT USEFUL FOR PRODUCING LIQUID CRYSTAL DISPLAY CELLS

Meinolph Kaufmann, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 30, 1978, Ser. No. 965,046

Claims priority, application Switzerland, Dec. 20, 1977, 15734/77

Int. Cl.³ C09K *3/34*

U.S. Cl. 428—35 **9 Claims**

1. A method of bonding together the mutually aligned glass plates of a liquid crystal display cell, which comprises

applying a gasket-shaped layer of a sealing cement between said glass plates,

joining said plates, and

curing said layer of sealing cement, thereby producing a layer of uniform thickness which determines the separation of said glass plates;

wherein said sealing cement comprises a particulate filler of variably sized particles in a quantity sufficient to closely pack said filler particles when said glass plates are mutually aligned and bonded together;

wherein the shortest distance between parallel tangential planes of each particle is substantially the same for a substantial majority of said particles and the shortest distance between parallel tangential planes for the remainder of said particles is less than said shortest distance between parallel tangential planes of said substantial majority of particles, whereby the spacing between said glass plates

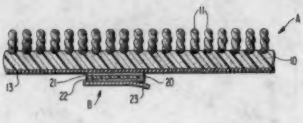
being bonded is determined by said shortest distance of said substantial majority of particles.

4,242,389

CARPET WEB HAVING PATTERNED ADHESIVE SEGMENTS ON THE BACKING THEREOF AND METHOD OF MANUFACTURE OF THE SAME

Charles I. Howell, Rocky Face, Ga., assignor to World Carpets, Inc., Dalton, Ga.

Filed Apr. 10, 1979, Ser. No. 28,753
Int. Cl.³ B32B *3/02, 33/00*
U.S. Cl. 428—40 **29 Claims**



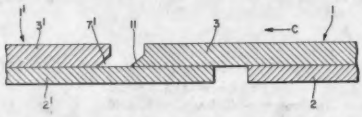
1. A flexible carpet web having a plurality of spaced apart pressure sensitive adhesive segments disposed in a patterned relationship on the backing thereof, the spacing between said centers of said adhesive segments being a function of the area of said adhesive segments, in relation to the area and weight of said carpet web, and said adhesive segments being spaced and configured for providing substantially uniform tensile adhesiveness longitudinally and transversely throughout said carpet web.

4,242,390

FLOOR TILE

Jozsef Nemeth, Kungälv, Sweden, assignor to AB Wicanders Korkfabriker, Alvengen, Sweden

Filed Mar. 22, 1978, Ser. No. 889,028
Claims priority, application Sweden, Mar. 3, 1977, 7703660
Int. Cl.³ B32B *7/04;* E04C *1/30*
U.S. Cl. 428—47 **26 Claims**



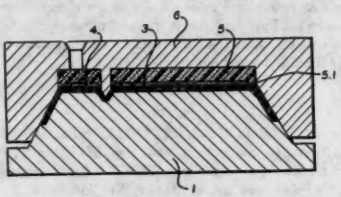
1. A tile for forming a floor wall or the like comprising a generally planar rectilinear member including a carrier layer and a superimposed surface layer; each of said layers having two pairs of mutually parallel side edges, one of said pairs comprising two adjacent side edges; and the other of said pairs comprising the other two side edges; the edges of the carrier layer in one of said pairs being formed with a groove and the corresponding edges of said surface being formed with a vertically square end; the edges of the carrier layer of the other of said pairs being formed with a tongue, the corresponding edge of said surface being formed with a vertically square end; the bottom surface of said groove and tongue being planar and parallel with the lower surface of said rectilinear member, the upper surface of said groove and tongue being slanted with respect to the bottom surface thereof to form an acute angle; the extent of said tongue being less than the depth of said groove, and the angle of the groove being less than the angle of the tongue, whereby the tongue of one tile and the groove of another tile are cooperable to permit penetration of the tongue into the groove to an extent less than the depth thereof, with the square ends of the surface abutting each other to provide a smooth extended surface and said tongue and groove providing a space therebetween for receipt of adhesive, said tongue and groove and abutting floor surface preventing escape of adhesive therefrom.

4,242,391

NOISE BARRIER PAD AND THE METHOD FOR THE PRODUCTION OF SAME

Hans Reinhardt, Hirschberg; Manfred Schmahl, Worms, and Armin Tritsch, Weinheim, all of Fed. Rep. of Germany, assignors to Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 915,095
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727299
Int. Cl.³ B32B *5/20, 27/06;* B29D *27/04*
U.S. Cl. 428—76 **2 Claims**



1. A process for producing a noise barrier pad for industrial vehicles, comprising forming a shaped tread layer by reacting a mixture for a polyurethane foam having a density of about 600–1100 kg/m³ in a hollow mold having separable upper and lower parts and which is shaped so as to form the tread layer; removing the upper mold part; placing a blank of noise barrier material comprising a heavy spar layer on a portion of the bottom side of the tread layer; placing over the lower mold part a second upper mold part so as to define with the lower mold part, tread layer and spar layer a cavity; and filling the cavity with a reaction mixture to form therein a bottom layer of polyurethane foam having a density of about 150–600 kg/m³, the bottom layer in conjunction with the tread layer encapsulating the spar sheet and thereby fixing it in position.

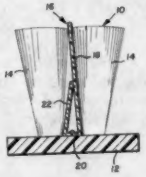
2. A noise barrier pad produced by the method of claim 1.

4,242,392

SOFT BARRIER FIN WEATHERSTRIP AND METHOD OF MANUFACTURE

Charles Yackiw, Fairport, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,980
Int. Cl.³ D04H *11/00;* E06B *7/22*
U.S. Cl. 428—85 **14 Claims**



5. In a soft barrier fin weatherstrip having a base strip; a pair of longitudinally extending spaced parallel rows of pile attached to said base strip; and a soft barrier fin of air pervious material secured on edge to said base strip between said rows of pile; the improvement comprising coating or impregnating said fin with a waxy material which fills the openings or interstices in said air pervious material so that in use said coated fin maintains its up-right position and effectively resists air and moisture infiltration while retaining its softness.

4,242,393

CARPET TILES

Willem H. L. Leupen, Picton, Australia, assignor to Heuga Australia Production Pty. Ltd., North Sydney, Australia

Filed Feb. 7, 1979, Ser. No. 10,193
Int. Cl.[3] E04D 1/00
U.S. Cl. 428—95 6 Claims

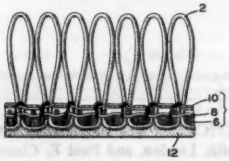
1. A carpet or carpet tile comprising a carpet, a secondary backing sheet and a layer of a backing composition which comprises an admixture with bitumen of a limestone-type filler comprising particles all of wich are less than 1 mm, 10% to 50% by weight of which are between 1 mm and 77μ and 90% to 50% of which are less than 77μ, the combination of filler and bitumen having a ball and ring softening point of 373 K to 403 K and a penetration of 5 to 25 points.

4,242,394

REINFORCED PRIMARY BACKING FOR TUFTED PILE FABRICS

Ronald J. Leib, and Moses Sparks, Jr., both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 9, 1979, Ser. No. 55,893
Int. Cl.[3] D04H 11/00, 11/08
U.S. Cl. 428—95 10 Claims



6. A tufted pile fabric comprising: (a) a reinforced primary backing comprising a non-woven fibrous capping layer, a reinforcing material layer, and a woven backing layer, said non-woven fibrous capping layer being positioned adjacent one side of said reinforcing material layer and said woven backing layer being positioned adjacent the other side of said reinforcing material layer, said non-woven fibrous capping layer being needled into and extending through said reinforcing material layer and continuing into and through said reinforcing material layer to the outside surface of said backing layer; and, (b) yarn tufted through said reinforced primary backing to define a tufted face yarn supported by and extending above said reinforced primary backing.

4,242,395

THERMOPLASTIC COMPOSITIONS AND AUTOMOTIVE CARPETING BACKED THEREWITH

Joseph L. Zuckerman, Livingston, and John W. Bzik, North Haledon, both of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,693
Int. Cl.[2] D03D 27/00; D04H 11/00
U.S. Cl. 428—96 4 Claims

1. A tufted automotive carpet comprising a base fabric stitched with erect loops of yarn to form tufts on the top side of the base fabric and a thermoplastic backing composition on the bottom side of said base fabric, said composition comprising by weight:

(a) About 5-25 percent of an ethylene containing polymer selected from the group consisting of polyethylene and ethylene/mono-unsaturated ester copolymer,

(b) About 1-10 percent of a non-vulcanized elastomeric resin,

(c) About 60-90 percent of an inert mineral filler, and

(d) About 1-15 percent of a plasticizer.

4,242,396

FILMS OF THERMOPLASTICS MATERIALS HAVING ROUGHENED SURFACES

John R. Wilson, Knebworth, and Terence I. Worbey, Hitchin, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 19, 1977, Ser. No. 862,297
Claims priority, application United Kingdom, Oct. 20, 1977, 43707/77
Int. Cl.[2] B32B 3/30, 5/22
U.S. Cl. 428—141 23 Claims

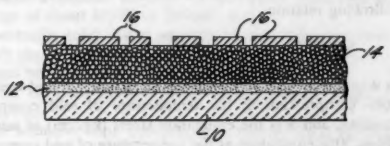
1. A thermoplastics film suitable for use as a drafting material, which comprises a self-supporting film of a thermoplastics material, at least one surface of said film being roughened by filler particles included in the thermoplastics material adjacent the surface, said filler particles having a nominal particle size in the range 4 to 15 μm, and a matt layer adherent to but not masking the roughened surface comprising a binding resin and secondary filler particles having a nominal particle size in the range 1 to 15 μm in an amount in the range 10 to 100% by weight based upon the weight of the binding resin, said matt layer having a coat weight in the range 0.05 to 2.0 g/m^2.

4,242,397

FLEXIBLE SHEET-TYPE COVERING MATERIAL

George R. Ferment, Randolph, N.J., and Douglas C. Woerner, Northampton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed May 7, 1979, Ser. No. 36,605
Int. Cl.[3] B32B 3/26
U.S. Cl. 428—141 3 Claims



1. Decorative, flexible, sheet-type covering material comprising a flexible, porous mat having adhered to at least one face thereof a layer between about 2 and about 50 mils thick of mechanically frothed and crushed, heat cured, flexible, foamed thermoplastic vinyl polymer wherein:

(a) the surface of the crushed layer has a height variation of less than about 1 mil; and

(b) the openings in the porous mat average between about 1 and about 20 mils in the smallest linear dimension with at least about 50% of such openings having smallest linear dimensions between about 2 and about 10 mils; said covering material also including a layer of foamed plastic material adhered to the layer of crushed thermoplastic and a decorative pattern applied to the surface of the foamed plastic layer.

4,242,398

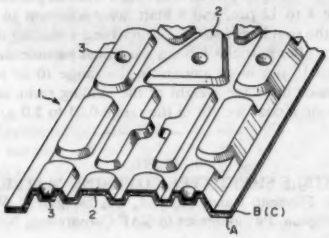
FIBROUS SHAPED ARTICLE HAVING NON-LEVEL SURFACE

Yasuhiko Segawa, and Noritsugu Saiki, both of Iwakuni, Japan, assignors to Teijin Limited, Japan

Filed Jun. 25, 1979, Ser. No. 51,742
Claims priority, application Japan, Jan. 16, 1979, 54-2163; Jan. 16, 1979, 54-2164
Int. Cl.[3] B32B 3/26, 5/02, 5/22
U.S. Cl. 428—172 30 Claims

1. A fibrous shaped article having a surface with raised and depressed portions, said fibrous article consisting of a unitary laminated structure resulting from the compression molding under heat of (A) a heat compression-moldable nonwoven

fibrous web and (B) a nonwoven fibrous sheet, said fibrous sheet (B) being laminated to at least one surface of said fibrous web (A); said fibrous web (A) having a compression stress, at 10% compression at the temperature of said compression molding, of at least 0.5 g/cm^2; said nonwoven fibrous sheet (B) consisting of a continuous unitary reticulated sheet structure of an assembly of many fibers of a thermoplastic polymer, said constituent fibers having both an initial modulus of not more than 5 g/denier and an elongation of at least 20%, at the temperature of said compression molding and being interconnected in a spaced-apart relationship, and said nonwoven fibrous sheet (B) having a plastic deformation ratio, at 30% elongation at the temperature of said compression molding, of at least 50% and an elongation stress, at 30% elongation at the



temperature of said compression molding, of not more than 0.15 kg/cm; and said web (A) and said sheet (B) satisfying the following relation:

$$S \leqq 0.03T$$

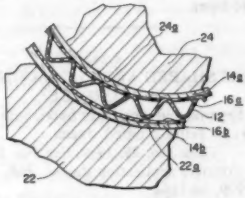
in which T is the compression stress (g/cm^2) of said web (A) at 10% compression at the temperature of said compression molding, and S is the elongation stress (kg/cm) of said sheet (B) at 30% elongation at the temperature of said compression molding and said fibrous shaped article having an air permeability of more than 2 ml.cm^{-2}.sec^{-1}, a sound absorption ratio of more than 3% at 100–500 Hz, more than 3% at 500–2000 Hz and more than 30% at more than 2000 Hz, a flexural strength of more than 0.03 kg.cm^{-1}, and a modulus of elasticity of more than 0.04 kg.cm^{-2}.

4,242,399

CORRUGATED PAPERBOARD FOR TRIM BOARD AND METHOD OF PRODUCING THE SAME

Toshihiko Fujii, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 6, 1978, Ser. No. 912,964
Claims priority, application Japan, Jun. 9, 1977, 52-68587
Int. Cl.[2] B32B *3/28, 3/00*
U.S. Cl. 428—186 **11 Claims**



1. A press-formable corrugated paperboard substrate which is to be press-formed to form a shaped board substrate of a trim board, comprising:

a corrugated medium of paper having first and second groups of crests, said first group of crests being defined on one face of said medium and said second group of crests being defined on the other face of said medium;

a first liner of paper placed on said first group of crests;

a first layer of thermoplastic resin disposed between said first liner and said first group of crests to achieve tight bonding therebetween;

a second liner of paper placed on said second group of crests; and

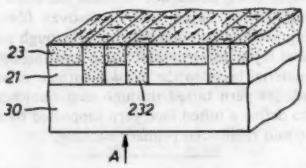
a second layer of thermoplastic resin disposed between said second liner and said second group of crests to achieve bonding therebetween, the total bonding force provided between said second liner and said second group of crests being less than that between said first liner and said first group of crests, resulting in that upon being subjected to press-forming under heating, relative displacement between said second liner and each of said second group of crests occurs while that between said first liner and each of said first group of crest portions is prevented.

4,242,400

MAGNETICALLY STRUCTURED MATERIALS

Andrew L. Smith, London, and Paul E. Claes, Hayes, both of England, assignors to E M I Limited, Hayes, England

Filed Oct. 4, 1978, Ser. No. 948,497
Claims priority, application United Kingdom, Oct. 15, 1977, 42970/77
Int. Cl.[3] B32B *3/00*
U.S. Cl. 428—201 **20 Claims**



1. A method of producing a member having a magnetically and (as hereinbefore described) visibly detectable structure including,

providing on a support a first layer of a first material held dispersed in a first binder which has been dried but is still softenable without damage,

providing a supply of a coating liquid of a second, magnetisable, material, visibly distinct from the first material and dispersed in a second binder and a solvent therefor, which solvent also comprises a partial solvent for the first binder,

applying the coating liquid over the first layer to form a second layer,

subjecting the two layers, in selected spaced regions thereof, to a magnetic field having a field gradient across the layers sufficient to cause magnetisable particles of the second material to enter the body of the first layer and mix with the first material, freed from the hold of the first binder by said partial solvent to impart to said first layer a magnetically and visibly detectable structure,

causing or permitting the dispersion to dry to hold the first and second materials in their respective positions.

4,242,401
SCREEN-PRINTING MASK

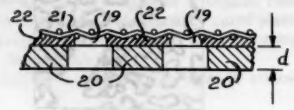
Minoru Mitani; Kiyoharu Hashimoto; Kenjiro Ninomiya; Toshikiyo Miyazaki; Otokuma Hashimoto, and Hideki Mori, all of Fuchu, Japan, assignors to Mitani Electronics Industry Corp., Tokyo, Japan

Filed Nov. 2, 1978, Ser. No. 957,187

Claims priority, application Japan, Jan. 24, 1978, 53-5831; Jan. 24, 1978, 53-5832; Jan. 24, 1978, 53-5833; Jan. 24, 1978, 53-6344[U]; Jan. 24, 1978, 53-6346[U]; Jan. 24, 1978, 53-6349[U]; May 23, 1978, 53-68576[U]

Int. Cl.[3] B05C *17/06;* B41F *15/34;* B41L *13/12;* B41N *1/24*

U.S. Cl. 428—201 3 Claims



1. A screen-printing mask to be used for printing on a previously-printed projection comprising a pattern screen and a spacer emulsion layer provided on at least a part of the bottom side of said pattern screen, excluding the circumferential edge portion of the pattern to be printed, said spacer emulsion layer having a thickness corresponding to the height of the previously-printed projection on which the pattern will be printed.

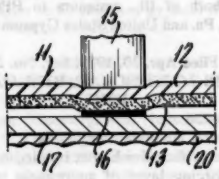
4,242,402
LIFT-OFF TAPE AND PROCESS

Ralf Korpman, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 820,677, Aug. 1, 1977, Pat. No. 4,166,706. This application Apr. 2, 1979, Ser. No. 25,965

Int. Cl.[3] B41J *31/05;* B32B *27/32, 7/02*

U.S. Cl. 428—212 6 Claims



1. A typewriter lift-off tape for removing typed ink impressions comprising a non-adhesive backing layer and a normally non-tacky elastic adhesive layer on one major surface of the backing layer, said backing layer being relatively inextensible and said adhesive layer being relatively extensible; wherein in said tape, the adhesive layer

(1) comprises an adhesive composition consisting essentially of

(a) thermoplastic and elastomeric A-B block copolymers in which

(i) the A-blocks are thermoplastic being derived from styrene or styrene homologs, possess a number average molecular weight of at least about 6,000, and constitute about 5 to about 50 percent by weight of the block copolymer, and

(ii) the B-blocks are elastomeric being derived from conjugated dienes or lower alkenes and possess a number average molecular weight in the range of about 45,000 to 180,000, and

(b) normally solid resins adapted to associate principally with the thermoplastic A-blocks of said copolymers, said resins being employed in an amount of from about 40 to about 90 parts by weight per 100 parts by weight of the block copolymer; and

(2) exhibits a plastic state at low elongations and an elastic state at high elongations, and has the property of being converted from a normally non-tacky and plastic state to a tacky and elastic state when struck by a typewriter key.

5. A tacky adhesive film or a film having a tacky adhesive portion, said film obtained by applying substantial mechanical stress in whole or in part to a non-tacky adhesive film having a composition consisting essentially of

(a) thermoplastic and elastomeric A-B block copolymers in which (i) the A-blocks are thermoplastic being derived from styrene or styrene homologs, possess a number average molecular weight of at least about 6,000, and constitute about 5 to about 50 percent by weight of the block copolymer, and (ii) the B-blocks are elastomeric being derived from conjugated dienes or lower alkenes and possess a number average or molecular weight in the range of about 45,000 to 180,000, and

(b) normally solid resins adapted to associate principally with the thermoplastic A-block of said copolymers, said resins being employed in an amount of from about 20 to about 120 parts per 100 parts by weight of the block copolymer.

6. An adhesive tape comprising a non-adhesive backing layer and a tacky adhesive layer on one major surface of the backing layer, said tape prepared by

(1) extruding to a film, a composition consisting essentially of

(a) thermoplastic and elastomeric A-B block copolymers in which (i) the A-blocks are thermoplastic being derived from styrene or styrene homologs, possess a number of average molecular weight of at least about 6,000 and constitute about 5 to about 50 percent by weight of the block copolymer and (ii) the B-blocks are elastomeric being derived from conjugated diene or lower alkene and possess a number average molecular weight in the range of about 45,000 to 180,000, and

(b) normally solid resins adapted to associate principally with the thermoplastic A-blocks of said copolymer, and resins being employed in an amount of from about 20 to 120 parts by weight per 100 parts by weight of the block copolymer;

(2) stretching said film to convert it from a normally non-tacky and plastic state to a tacky and elastic state;

(3) allowing the tacky stretched film to relax; and

(4) laminating said film to the backing layer.

4,242,403
AUTOMOTIVE GLAZING UNITS AND METHOD OF PRODUCING THE SAME

Paul T. Mattimoe, Toledo; Theodore J. Motter, Genoa, and Stephen P. Bartus, Jr., Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

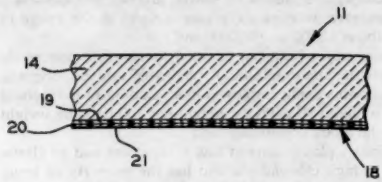
Filed Aug. 2, 1976, Ser. No. 710,424

Int. Cl.[3] B32B *7/02, 17/10*

U.S. Cl. 428—213 1 Claim

1. In a clear transparent temperature stable glazing structure consisting essentially of a transparent substrate with a protec-

tive shield thereover carrying a coating of silica reinforced organopolysiloxane; a sheet of float glass not appreciably more than 0.100" in thickness providing said substrate; and said protective shield over said substrate comprising a layer of a relatively soft and extensible plastic in a thickness between approximately 0.015" and 0.030" and having one surface



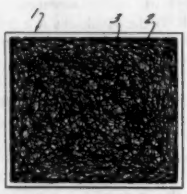
bonded to a surface of said substrate, a carrying sheet in the form of a layer of indentation resistant polyester plastic in a thickness between approximately 0.0005" and 0.014" and having one surface bonded to the opposite surface of said soft and extensible plastic layer, and an abrasion resistant coating of a fully cured silica reinforced methyl siloxane compound on and tightly adherent to the opposite surface of said carrying sheet.

4,242,404

HIGH-STRENGTH GLASS FIBER MAT PARTICULARLY USEFUL FOR ROOFING PRODUCTS

Alfredo A. Bondoc, Middlesex; V. Robert Canfield, Martinsville, and B. Randall Ziegler, Freehold, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 16, 1979, Ser. No. 39,577
Int. Cl.[3] B32B *27/00*
U.S. Cl. 428—220 **8 Claims**



1. A high-strength glass fiber mat useful for roofing products which is formed from bundles of glass fibers by the wet-laid process, said fibers having a length of about 1¼ to 3 inches and a diameter of about 8 to 20 microns, comprising:

(a) a plurality of individual glass fibers comprising about 20% to 60% by weight of the fibrous material in said mat,

(b) a plurality of extended glass fiber elements comprised of longitudinally connected fibers said elements there having a length which is greater than the length of the fibers in said element, and a diameter which is non-uniform, being greater in the mid-portion thereof than at its ends, said elements comprising about 40% to 80% by weight of the fibrous mateial in said mat,

both said individual fibers and said extended fiber elements being substantially randomly oriented and uniformly dispersed throughout said material, and,

(c) a binder substance to hold said fibrous material together.

4,242,405

VISCOSE RAYON AND METHOD OF MAKING SAME

Gregory C. Bockno, Media, Pa., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 795,059, May 9, 1977, abandoned, which is a continuation of Ser. No. 664,773, Mar. 8, 1976, abandoned. This application Jan. 15, 1979, Ser. No. 3,680
Int. Cl.[2] D01F *2/06*; D02G *3/00*
U.S. Cl. 428—224 **12 Claims**

1. A regenerated cellulose fiber having a wet tenacity about 2.0 to 3.5 grams per denier, a conditioned tenacity of about 3.7 to 5.3 grams per denier, a wet extensibility between about 13% and 25%, a conditioned extensibility between 15% and 22%, and having a wet modulus between 5.5 and 14.0 and being further characterized in having a multilobular, skin core cross-section wherein the core is surrounded by a continuous uninterrupted skin, having a smooth periphery and having been formed by the method comprising preparing a modifier-free viscose containing from about 5% to 9% cellulose, from about 5% to 9% caustic soda and from 30% to 42% carbon disulfide based upon the weight of cellulose, ripening the viscose to a sodium chloride salt index of 12 to 18 and a spinning ball fall of between 65 and 110 seconds, extruding the ripened viscose into an aqueous spinning bath containing from about 5% to 8% sulfuric acid, from about 3% to 6% zinc sulfate and from about 9% to 15% sodium sulfate, maintained at a temperature between 30 degrees centigrade and 48 degrees centigrade, withdrawing the filaments through an aqueous stretch bath maintained at a temperature between 80 degrees centigrade and 98 degrees centigrade, and controlling residence time in the spin bath so as to allow stretching the filaments in the stretch bath from about 85% to 150%.

4,242,406

FIBER REINFORCED COMPOSITE STRUCTURAL LAMINATE COMPOSED OF TWO LAYERS TIED TO ONE ANOTHER BY EMBEDDED FIBERS BRIDGING BOTH LAYERS

Larbi El Bouhnini, Hanover Park; Thomas J. Fitzpatrick, Libertyville, both of Ill.; Donald M. Harwick, Pittsburgh, Pa.; Robert M. Hoffman, Palos Heights, and Wayne M. Knoll, Wheaton, both of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa. and United States Gypsum Company, Chicago, Ill.

Filed Apr. 30, 1979, Ser. No. 34,695
Int. Cl.[3] B28B *1/32*; B29C *5/02*; B32B *13/02, 13/12, 13/14*; E04C *2/26*
U.S. Cl. 428—236 **10 Claims**

1. A structural laminate comprising:

(a) a plastic surface finish coat bonded to

(b) a reinforcing layer of an organic resin selected from polyester resins and epoxy resins containing reinforcing fibers, adhered to

(c) a bonding layer of organic resin coated glass fibers which are bonded to the reinforcing layer and which protrude therefrom, said glass fibers being present in an amount sufficient to provide a surface density of 0.25 to 0.65 ounces per square foot of reinforcing layer surface area, said protruding glass fibers being coated with an amount of the organic resin sufficient to promote adhesion of the fibers to one another at their intersections, but insufficient

to encapsulate the fibers so as to prevent the gypsum layer (d) from intimately surrounding and engaging a substantial portion of the individual protruding coated fibers, said coated glass fibers being engaged and surrounded by

(d) a gypsum layer reinforced with glass fibers which functions as the structural base, and said structural laminate is characterized by having a bond strength between the gypsum layer and the plastic layer with which it interfaces of at least about 150 psi as determined by ASTM C297-68.

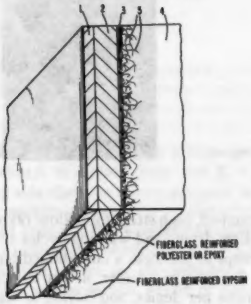
6. A process for making a structural laminate comprising:

(a) applying a curable plastic finish coat containing a catalyst therefor to the surface of a mold;

(b) partially curing said curable plastic finish coat;

(c) applying a reinforcing layer of organic resin containing reinforcing fibers to said partially cured plastic finish coat by spraying said organic resin and reinforcing fibers onto said plastic finish coat;

(d) densifying said reinforcing layer to remove entrapped air;



(e) while said reinforcing layer is tacky, applying a bonding layer of chopped glass fibers by dry spraying said glass fibers onto said reinforcing layer in such a manner that said glass fibers protrude from said reinforcing layer;

(f) applying a light mist organic resin coating by spraying a limited amount of catalyzed resin over the surface of the protruding glass fibers;

(g) allowing the organic resin coating on the protruding glass fibers and the organic resin of the reinforcing layer to cure to at least the gel state;

(h) applying a neat coat of plaster containing no glass fibers by spraying the plaster onto the protruding glass fibers;

(i) applying a layer of glass reinforced plaster onto the protruding fibers by simultaneously spraying the plaster and operating a glass chopper to supply a stream of chopped glass fibers into the wet plaster; and

(j) drying the plaster to form a hard gypsum structural base.

4,242,407

PROCESS FOR THE MANUFACTURE OF ARTICLES OF WATER-HARDENING MATERIAL

Jan M. J. M. Bijen, Munstergeleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Dec. 19, 1978, Ser. No. 971,065

Claims priority, application Netherlands, Dec. 30, 1977, 7714571

Int. Cl.[2] **B32B** *7/00, 3/18;* **B28B** *11/16;* **B29H** *9/02*

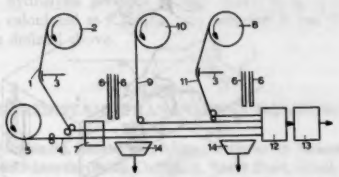
U.S. Cl. 428—247 **25 Claims**

1. A shaped article comprised of at least one layer of a water-hardening material reinforced with at least five fibrillated organic films which have been enlarged in a direction approximately lateral to the direction of fibrillation so as to form networks, each having a plurality of meshes, wherein the number of networks in said layer and the average number of meshes in said networks with a minimum of two per square centimeter are such that the average number of meshes per cubic centimeter of said layer is greater than 100.

5. In a process for the manufacture of shaped articles from water-hardening materials reinforced with a plurality of networks of fibrillated organic films, the improvement comprising the steps of:

forming continuous lengths of networks from fibrillated organic films, each containing a plurality of meshes;

simultaneously advancing a plurality of said networks into



contact with a water-hardening material so as to form at least one composite layer of said networks impregnated with said water-hardening material; and shaping said at least one layer into the desired configuration for said shaped article, and allowing it to set;

wherein the average number of meshes within said network, with a minimum of two per square centimeter, and the number of networks within said at least one layer are such that the average number of meshes per cubic centimeter of said shaped article is at least 100.

4,242,408

EASILY DISPOSABLE NON-WOVEN PRODUCTS HAVING HIGH WET STRENGTH AT ACID PH AND LOW WET STRENGTH AT BASE PH

Syamalarao Evani, and William A. Foster, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 820,952, Aug. 1, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 52,053

Int. Cl.[3] **A61F** *13/18, 13/20;* **B32B** *25/02*

U.S. Cl. 428—290 **9 Claims**

1. A non-woven flexible web having enhanced wet strength and easy disposability, said web comprising a mat of non-woven fibers impregnated with the acid form of a terpolymer formed by the reaction of an unsaturated monomer controlling the hydrophobicity of the terpolymer an unsaturated carboxylic acid and an alkyl capped polyoxyethylene moiety having an ethylenically unsaturated terminal group and at least about 10 oxyethylene units, the monomers having been reacted in a ratio that said polymer is insoluble below pH 6 and soluble at higher pH values.

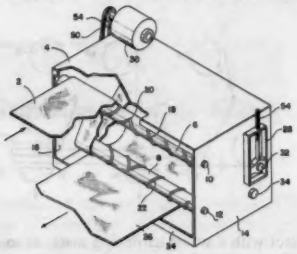
5. A method for treating a non-woven flexible web to enhance its wet strength and disposability wherein said web (1) while in a swollen state is impregnated with an ammonium hydroxide solution or dispersion of a linear terpolymer formed by the reaction of an unsaturated monomer controlling the hydrophobicity of the terpolymer, an ethylenically unsaturated carboxylic acid, and an alkyl capped polyoxyethylene moiety having an ethylenically unsaturated terminal group and at least about 10 oxyethylene units, the monomers being in a ratio that said polymer is water insoluble below pH 6 and soluble above pH 6, (2) is dried and (3) said polymer is converted to its acid form.

4,242,409

PROCESS FOR CRIMPING A NON-WOVEN MAT AND FOAM STRUCTURE PRODUCED THEREWITH

Lawrence J. Parker, Converse, Tex., assignor to Shelter Insulation, Inc., San Antonio, Tex.

Filed Dec. 1, 1978, Ser. No. 965,420
Int. Cl.[3] B29J 1/02; B32B 3/26
U.S. Cl. 428—297 20 Claims



1. A method of disrupting the fiber structure and at least doubling the thickness of a non-woven fibrous mat comprising

passing said non-woven fibrous mat under tension over a first rotating roll having extending radially outwardly therefrom and helically therearound at least one rib formed in a chevron pattern, wherein the portions of the rib extending away from the point of the chevron are curved continuously over substantially the entire width of the mat, and

passing said mat over a second rotating roll having extending radially outward therefrom and helically therearound at least one rib formed in a chevron pattern disposed on said second roll, wherein the portions of the rib extending away from the point of the chevron are curved continuously over substantially the entire width of the mat, and

wherein both of said first and second rolls are disposed with the portion of the chevron pattern defining an angle less than 180° toward the mat portion coming into contact with said first or second roll.

4,242,410

PROCESS FOR THE PRODUCTION OF FOAM PLASTICS BASED ON POLYISOCYANATES HAVING A LIGHT AND YELLOWING RESISTANT TOP LAYER AND RESULTANT PRODUCT

Eberhard König, Kronberg; Manfred Schönfelder, Leverkusen, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 10,567
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806215
Int. Cl.[3] B32B 5/18; B29D 27/04
U.S. Cl. 428—315 13 Claims

1. A process for the production of molded polyisocyanate-based foam products having a compact, light- and yellowing-resistant polyurethane-based top layer comprising the steps of:

A. coating a mold with a liquid coating agent, containing a binder, which reacts to form a light- and yellowing-resistant top layer and

B. introducing a foamable reaction mixture into said mold, wherein said binder comprises:

(i) at least one isocyanate prepolymer having at least two exclusively aliphatically and/or cycloaliphatically bound isocyanate groups and

(ii) a hardener mixture prepared by heating primary polyamines, which have aliphatically and/or cycloaliphatically-bound amino groups with ketones either in the presence of water or with subsequent addition of water and which hardener mixture comprises water and primary polyamines, at least partly in ketimine-blocked form, which have aliphatically and/or cycloaliphatically bound amino groups.

13. The product of claim 1.

4,242,411

HIGH CRIMP, HIGH STRENGTH, HOLLOW RAYON FIBERS

Eugene Costa, Jr., Goshen, and Madhu P. Godsay, Monroe, both of N.Y., assignors to International Paper Company, New York, N.Y.

Division of Ser. No. 908,982, May 25, 1978, Pat. No. 4,182,735.
This application Mar. 26, 1979, Ser. No. 23,705
Int. Cl.[2] D02G 3/00
U.S. Cl. 428—369 2 Claims

1. High crimped, high strength, hollow rayon fibers resistant to collapse after drying and washing cycles and having at least about 20 crimps to the inch, a conditioned tenacity of greater than about 3 grams per denier, a wet tenacity greater than about 1.5 grams per denier, and having at least about 90 percent of its fibers hollow.

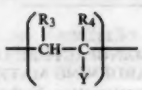
4,242,412

COATED MATERIALS AND PRODUCTION THEREOF

Masaaki Funaki, Toyonaka; Motoaki Yoshida, Kawanishi; Yoshinori Shimauchi, Kirenishi; Akira Fujioka, Osaka, and Kazuo Sakiyama, Ibaraki, all of Japan, assignors to Simitomo Chemical Company, Limited, Osaka, Japan

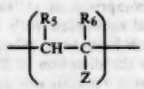
Filed Sep. 18, 1978, Ser. No. 943,813
Claims priority, application Japan, Sep. 27, 1977, 52-116536
Int. Cl.[3] B32B 27/36; B05D 3/02; B32B 17/10, 23/08
U.S. Cl. 428—412 14 Claims

1. A formed material of plastics or glass coated with an undermost film (3), a resin film (1) and a melamine resin film (2), said undermost film (3) being formed on the surface of said formed material by using a polymer (A) having a unit of the formula (II),



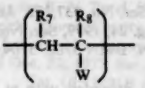
(II)

wherein R_3 and R_4 are independently a hydrogen atom or a lower alkyl or carboxyl group, and Y is a carboxyl or amino group-containing side chain, or a polymer (B) having both units of the formulae (III) and (IV),



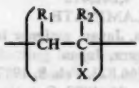
wherein R_5 and R_6 are independently a hydrogen atom or a

lower alkyl or carboxyl group, and z is a hydroxyl group-containing side chain, and



(IV)

wherein R_7 and R_8 are independently a hydrogen atom or a lower alkyl or a carboxyl group, and W is a side chain having a carboxyl, amino, substituted amino, epoxy or tetrahydrofuryl group, said resin film (1) being formed on the surface of said undermost film (3) by using (a) a mixture of methoylolmelamine in which all or a part of the methylol groups are alkyletherified, and a polyhydric alcohol having a molecular weight of 1,500 or less which may contain an ethylene oxide or propylene oxide chain, or a pre-condensate thereof, (b) a mixture of a monomer having a unit of the formula (I),



(I)

wherein R_1 and R_2 are independently a hydrogen atom or a lower alkyl, carboxyl or amino group and X is a hydroxyl group-containing side chain, or a homopolymer or copolymer thereof, and a crosslinking agent, or (c) a mixture of (a) and (b), and said melamine resin film (2) being formed on said resin film (1) by using (d) a mixture of methylolmelamine in which all or a part of the methylol groups are alkyletherified, and a polyhydric alcohol having a molecular weight of 100 to 2,000 and an ethylene oxide chain, or a pre-condensate thereof, and (e) a surface active agent.

4,242,413

VAPOR PLATING METHOD FOR PLASTICS

Shunji Iwahashi, Toyonaka; Masahiro Yamasaki, Ibaraki, and Masakazu Sagou, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 22, 1977, Ser. No. 790,061

Claims priority, application Japan, Apr. 22, 1976, 51-46260

Int. Cl.[2] B05D *1/36, 7/04;* **C23C** *13/02;* **G02B** *1/10*

U.S. Cl. 428—412 **5 Claims**

1. A process for vapor plating the surface of a plastic substrate with a metal, said plastic substrate being made of a material selected from the group consisting of polymethyl methacrylate, polycarbonate, acrylonitrilebutadiene-styrene terpolymer, polyacetal, methyl methacrylate-styrene copolymer and polystyrene comprising; coating said surface with a coating composition to form a coating film on said surface for making said surface smooth and improving the adhesion between said substrate and said metal, and vapor plating the coated surface with the metal, said coating composition comprising the following components dissolved in a solvent:

(A)

a product obtained by partial hydrolysis of a mixture of a compound of the formula: $R_nSi(OR')_{4-n}$ wherein n is an integer of 1 to 3, R is a hydrocarbon group having 1 to 6 carbon atoms and R is an alkyl group having 1 to 4 carbon atoms, and a tetraalkoxysilane, or

(ii) a mixture of each partial hydrolysis product of said $R_nSi(OR')_{4-n}$ compound and the partial hydrolysis product of said tetraalkoxysilane, or

(iii) a mixture of said partial hydrolysis product (i) and said mixture of each partial hydrolysis products (ii),

the amount of the partial hydrolysis product of said tetraalkoxysilane, calculated as SiO_2, being 5 to 100 parts by weight to 100 parts by weight of the partial hydrolysis product of said $R_nSi(OR')_{4-n}$ compound, calculated as $R_nSiO_{(4-n)/2}$, wherein n and R are each as defined above; and

(B)

(i) a copolymer of at least one of alkyl acrylates and alkyl methacrylates with at least one of hydroxyalkyl acrylates and hydroxyalkyl methacrylates, and

(ii) etherified methylolmelamine, the amounts of said copolymer (i) and said etherified methylolmelamine (ii) being 5 to 200 parts by weight and 0 to 150 parts by weight, respectively, based on 100 parts by weight of the partial hydrolysis product of said $R_nSi(OR')_{4-n}$ compound, calculated as $R_nSiO_{(4-n)/2}$, wherein n and R are each as defined above.

4,242,414

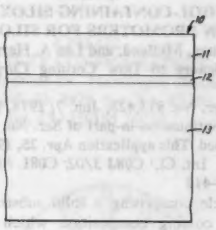
WEATHER-RESISTANT TRANSPARENT COMPOSITE FILM

Eugene L. McKenzie, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 860,340, Dec. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 568,474, Apr. 16, 1975, Pat. No. 4,064,314. This application Nov. 13, 1978, Ser. No. 959,721

Int. Cl.[3] B32B *27/30, 27/06*

U.S. Cl. 428—412 **7 Claims**



1. A transparent composite film useful as an inexpensive, non-brittle, impact-resistant, durable, outdoor-facing transparent panel comprising

(a) a continuous transparent high-tensile-strength polycarbonate support film;

(b) a continuous transparent weather-resistant oriented polymethylmethacrylate film; and

(c) a transparent adhesive layer disposed between said support and weather-resistant films to laminate the films together.

4,242,415

IN-MOLD COATING COMPOSITIONS CONTAINING FUNCTIONAL GROUP TERMINATED LIQUID POLYMERS

Joseph Feltzin; Thomas J. Galvin, and Erich Kuehn, all of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

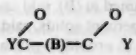
Continuation-in-part of Ser. No. 913,825, Jun. 8, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 972,912

Int. Cl.[3] C08L *75/00*

U.S. Cl. 428—412 **12 Claims**

1. A coating composition comprising:

2–15% by weight of an amine-terminated liquid polymer containing an average from about 1.7 to about 3 amine groups per molecule, said groups being primary, secondary or a mixture thereof, and said polymer having the formula:



wherein Y is selected from a univalent radical obtained by removing hydrogen from an amine group of an aliphatic, alicyclic, aromatic or a heterocyclic amine containing from 2–20 carbon atoms and at least two amine groups, at least two of said amine groups being primary, secondary or mixtures of primary and secondary amines, and B is a polymeric backbone comprising carbon-carbon linkages, and

20–50% by weight of a vinyl ester urethane resin having the following general formula: C—I—(D—N)$_t$. D—I—C, wherein C is a carbamyl-linked radical derived from a hydroxy-terminated ester of acrylic or methacrylic acid, D is a radical derived from polyalkoxylated bisphenol A type compounds, I is a radical derived from a polyisocyanate, N is a radical derived from an unsaturated aliphatic dicarboxylic acid or an anhydride thereof, and t is an integer equal to 1–5; and

30–60% by weight of co-polymerizable ethylenically unsaturated monomers.

4,242,416

ORGANOTHIOL-CONTAINING SILOXANE RESINS AS ADHESION PROMOTERS FOR SILOXANE RESINS

Ronald H. Baney, Midland, and Len A. Harris, Rhodes, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 913,423, Jun. 7, 1978, Pat. No. 4,177,175, which is a continuation-in-part of Ser. No. 863,968, Dec. 23, 1977, abandoned. This application Apr. 25, 1979, Ser. No. 32,989

Int. Cl.^{3} C08J *3/02;* **C08L** *83/04*

U.S. Cl. 428—412 **20 Claims**

1. An article comprising a solid substrate coated with a pigment-free coating composition which is a composition comprising a mixture of (A) a dispersion of colloidal silica in lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ or a dispersion of colloidal silica in ether esters of ethylene or propylene glycol-water solution, of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of alkyl radicals of 1 to 3 inclusive carbon atoms, the vinyl radical, the 3,3,3-trifluoropropyl radical, the gamma-glycidoxypropyl radical, the gamma-methacryloxypropyl radical and the phenyl radical, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition containing sufficient acid to provide a pH in the range of 2.5 to 6.0, having added thereto sufficient (B) to give 1–5 weight percent of the solids of (B) based on the weight of the total solids of (A) and (B) in the composition wherein (B) is an aqueous composition comprising a dispersion of colloidal silica in lower aliphatic alcohol-water solution of a partial condensate of a silanol of the formula $R'Si(OH)_3$ or a dispersion of colloidal silica in ether esters of ethylene or propylene glycol-water solution of a partial condensate of a silanol of the formula $R'Si(OH)_3$ in which R' is selected from HSR''— and $(HS)_2R''$— wherein R'' is selected from a group consisting of a divalent or trivalent aliphatic hydrocarbon radical having 1–6 carbon atoms and phenylene, the colloidal silica in (B) being present in the amount of 34 to 50 weight percent and the amount of $R'Si(OH)_3$ present in (B) being 50 to 66 weight percent both being based on the total weight of solids contained in (B), said composition (B) containing 10 to 50 weight percent solids, said composition (B) containing sufficient acid to provide a pH in the range of 2.8 to 5.2 until it is added to composition (A).

4,242,417

LITHOGRAPHIC SUBSTRATES

Jen-chi Huang, Yonkers, N.Y., assignor to Polychrome Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 937,222, Aug. 28, 1978. This application Aug. 24, 1979, Ser. No. 69,482

Int. Cl.^{3} G03C *1/94;* **B41N** *3/02, 3/04;* **C25F** *3/04*

U.S. Cl. 428—457 **17 Claims**

1. An aluminum sheet provided with at least one surface suitable for lithography by a method which comprises the steps of:

(a) mechanically graining said surface; and,

(b) immersing said aluminum sheet in a saturated aqueous solution of an aluminum salt of a mineral acid.

4,242,418

LAMINATE

Keishi Kitagawa, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 766,823, Feb. 8, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,919

Claims priority, application Japan, Feb. 10, 1976, 51/13796

Int. Cl.^{3} B32B *23/08, 27/08*

U.S. Cl. 428—507 **13 Claims**

1. A polyolefin-paper laminate comprising (a) a base paper (b) a polymeric component consisting of a copolymer of (1) about 5 to about 95 weight percent of at least one diene monomer which is a conjugated or non-conjugated diene selected from the group consisting of an aliphatic unsaturated hydrocarbon represented by the formula (I):

$$C_nH_{2n-2} \quad (I)$$

wherein n is an integer of 4 to 20 and (2) about 5 to about 95 weight percent of at least one styrene compound selected from the group consisting of styrene and styrene substituted by at least one of methyl, ethyl, isopropyl, butyl, hexyl, cyclohexyl, decyl, benzyl, chloro, chloromethyl ethoxymethyl, methoxy, bromo, carboxy or methoxy carbonyl incorporated into or coated on said base paper, and (c) an extrusion coated polyolefin layer thereon.

8. A polyolefin-paper comprising (a) a base paper, (b) a polymeric component consisting of a copolymer of (1) about 5 to about 95 weight percent of at least one diene monomer which is a conjugated or non-conjugated diene selected from the group consisting of an aliphatic unsaturated hydrocarbon represented by the formula (I):

$$C_nH_{2n-2} \quad (I)$$

wherein n is an integer of 4 to 20, (2) about 5 to about 95 weight percent of at least one styrene compound selected from the group consisting of styrene and styrene substituted by at least one of methyl, ethyl, isopropyl, butyl, hexyl, cyclohexyl, decyl, benzyl, chloro, chloromethyl ethoxymethyl, methoxy, bromo, carboxy or methoxy carbonyl, and (3) about 0.1 to about 20 weight percent of a monomer copolymerizable therewith and represented by the formula (III)

$$R_1—CH=\underset{\displaystyle COOH}{\overset{\displaystyle |}{C}}—R_2 \quad (III)$$

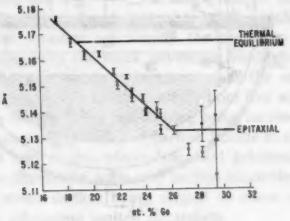
wherein R_1 and R_2, which may be the same or different, each is a hydrogen atom, an alkyl group, or an aryl group and (c) an extrusion coated polyolefin layer thereon.

4,242,419

EPITAXIAL GROWTH OF SUPERCONDUCTORS SUCH AS NB_3GE SUPERCONDUCTORS

Aly H. Dayem, Colts Neck, N.J.; Theodore H. Geballe, Woodside, Calif.; Chandra K. N. Patel, Summit, and Ping K. Tien, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1977, Ser. No. 865,510
Int. Cl.[2] H01B *1/02*
U.S. Cl. 428—661 6 Claims



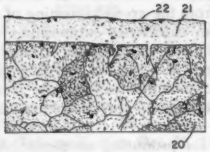
1. A superconducting body comprising a substrate; and a composition having a phase and a stoichiometric composition, said composition having a lattice constant, characterized in that said composition is epitaxially grown on a substrate having a lattice constant matching that of said composition within plus or minus 0.04 Angstroms; said composition is selected from the group consisting of Nb_3Ge, Nb_3Al, Nb_3Si and mixtures thereof. NbN and $Nb_xV_{1-x}C$, x between 0 and 1; said substrate being selected from the group consisting of Nb_xIr, Nb_xRh, Nb_3Pt, Ti_3Au and SiC.

4,242,420

SELECTIVE CHROMIZING IN A MOLTEN LEAD MEDIUM

John J. Rausch, Rte. 2, Box 177, Antioch, Ill. 60002, and Ray J. Van Thyne, 10148 S. Cook Ave., Oak Lawn, Ill. 60453, assignors to John J. Rausch; Ray J. Van Thyne and Material Sciences Corporation, all of Mt. Prospect, Ill.

Division of Ser. No. 840,368, Oct. 7, 1977, Pat. No. 4,168,333. This application Jul. 6, 1979, Ser. No. 55,686
Int. Cl.[3] C23C *9/00*
U.S. Cl. 428—667 2 Claims



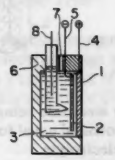
1. A surface-diffused part comprising a ferrous-based substrate and a zone at the surface of said substrate containing 12 to 45% chromium by weight, said zone having an outer surface which is substantially smooth and is free of gross porosity, said part being made by the process of providing a ferrous-based substrate and contacting said substrate with a molten alloy bath consisting essentially of lead and chromium as a surface-diffusing element, lead being the only transfer agent in said bath, said bath containing less than 0.85% chromium by bath weight of said lead, and diffusing said chromium into said substrate.

4,242,421

ELECTRODE CATALYST

Tetsuichi Kudo, and Hidehito Obayashi, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 19, 1979, Ser. No. 49,874
Claims priority, application Japan, Jun. 19, 1978, 53-73201
Int. Cl.[3] H01M *8/08*
U.S. Cl. 429—13 10 Claims



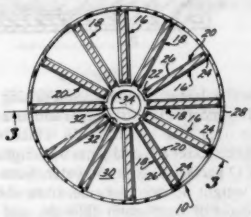
1. In a fuel cell containing an acidic electrolyte and methanol as the fuel and having fuel and air electrodes, the improvement wherein said fuel electrode comprises an electrode catalyst for the fuel cell formed of at least one boride of molybdenum, whereby said boride of molybdenum acts as a catalyst to the electrolytic oxidation reaction of said methanol in said acidic electrolyte.

4,242,422

BATTERY CONFIGURATION

Kau U. Lu, 6221 Foxshield Dr., Huntington Beach, Calif. 92647

Filed Jul. 13, 1979, Ser. No. 57,304
Int. Cl.[3] H01M *10/12*
U.S. Cl. 429—94 4 Claims



1. A lead-acid storage battery cell comprising a plurality of upright, flat anode and cathode plates arranged in equally spaced alternation in an upright completely cylindrical casing containing electrolyte throughout, said anodes and cathodes being disposed therewithin in radial alignment in a circle and all of said anode plates are coupled together in parallel and all of said cathode plates are likewise coupled together in parallel.

4,242,423

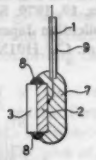
OPTICAL-CHARGING TYPE HALF-CELL, AND PHOTOCHEMICAL BATTERY USING THE SAME

Hiroshi Hada, Ootsu, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 22, 1979, Ser. No. 41,469
Claims priority, application Japan, May 26, 1978, 53-62939
Int. Cl.[3] H01M *6/30, 6/36*
U.S. Cl. 429—111 13 Claims

1. An optical-charging/rechargeable type half cell comprising: a metal electrode with a lead wire, and a thin plate of photoactive-semiconductor material in contact with said metal electrode, an auxiliary metal electrode in contact with said thin plate and said metal electrode, said metal electrode and thin plate being immersed in a liquid electrolyte containing metal ions from which metal is deposited on the surface of said pho-

toactive-semiconductor material by reduction of metal ions upon exposure to said photoactive-semiconductor material to



light, said auxiliary electrode being selected from metals having an iomization potential equal to or greater than that of said metal ions in said electrolyte.

4,242,424

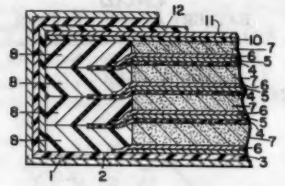
FLAT BATTERY

Sheldon A. Buckler, Lincoln; Fredric S. Cohen, Waltham, and David P. Kennedy, Cambridge, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 763,058, Jan. 27, 1977. This application Apr. 7, 1978, Ser. No. 894,369

Int. Cl.³ H01M *4/36, 6/12*

U.S. Cl. 429—152 **15 Claims**



1. A thin flat laminar battery, comprising a series of cells each including a cathode slurry layer and an anode slurry layer on opposite sides of a separator, in which the anode slurry layers comprise about 80 to 85 parts by weight of zinc powder, about 10 to 12 parts by weight of water, from about 1 to about 2 parts by weight of zinc chloride, from about 2 to about 4 parts by weight of ammonium chloride, and from about 1 to about 3 parts by weight of mercury.

4,242,425

NOVEL LITHIUM HALIDE BATTERY STRUCTURE

Matthew O'Boyle, Timonium; Bernard Icore, Randallstown, both of Md., and Marilyn J. Harney, Painesville, Ohio, assignors to Catalyst Research Corporation, Baltimore, Md.

Filed Feb. 21, 1980, Ser. No. 123,381

Int. Cl.³ H01M *2/26*

U.S. Cl. 429—181 **3 Claims**

1. A lithium halide battery comprising:

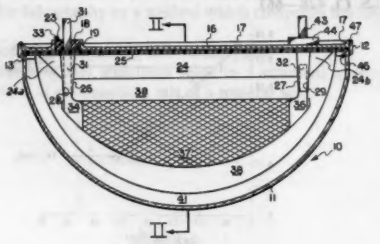
a. metal envelope having a top portion with an opening therethrough hermetically bonded thereto, said envelope including a peripheral flange forming a seat around the perimeter of the envelope;

b. a support means having its peripheral edge positioned on said seat and including a depending flange, said support means including first and second spaced apart post supports integrally formed with said flange, said first post support having an opening extending therethrough for alignment and communication with said opening in the top portion;

c. first and second posts engagingly positioned in the respective first and second post supports, said first post extending through said openings in said first post support and top portion, each of said posts extending beyond their respective post support;

d. an anode current collector connected to and extending between the first and second posts;

e. a pair of lithium anodes positioned on opposite sides of said support means flange and current collector and bonded together so as to sandwich therebetween said support means flange, posts and current collector;



f. a pair of depolarizer pellets molded to fit between said lithium anode and envelope and positioned in coextensive contact therewith; and

g. means for sealingly positioning said first post within the opening and electrically insulating said first post from the top portion.

4,242,426

PROCESS FOR ELECTROLYTE STRUCTURE WITH STRONTIUM TITANATE MATRIX FOR MOLTEN CARBONATE FUEL CELLS

Ronald H. Arendt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 5, 1979, Ser. No. 90,880

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—193 **3 Claims**

1. A process for producing an electrolyte structure for a molten carbonate fuel cell which comprises admixing from about 55% by weight to about 75% by weight of strontium titanate powder with from about 25% by weight to about 45% by weight of electrolyte based on the total weight of the mixture, and hot pressing the resulting mixture at a temperature ranging from about 480° C. to about 490° C. under a pressure of at least about 1000 psi, said strontium titanate being composed of crystallites which are at least significantly spherical and which have an average size ranging from about 0.1 micron to about 1 micron, said strontium titanate being selected from the group consisting of stoichiometric strontium titanate, strontium-rich titanate and mixtures thereof, said electrolyte being selected from the group consisting of a ternary lithium-potassium-sodium carbonates composition, a binary lithium-potassium carbonates composition, a binary lithium-sodium carbonates composition, a binary sodium-potassium carbonates composition and mixtures thereof, said electrolyte structure being at least substantially pore-free when said electrolyte is in molten form.

2. A process for producing an electrolyte structure for a molten carbonate fuel cell, said electrolyte structure consisting essentially of electrolyte and strontium titanate supporting matrix, which comprises providing strontium titanate powder wherein the crystallites are at least significantly spherical and have an average size ranging from about 0.1 micron to about 1 micron, forming said strontium titanate powder into a supporting matrix blank wherein the pore volume is interconnecting and comprised of capillary-sized interstices between compacted crystallites and is at least substantially uniformly distributed and ranges from about 50% by volume to about 70% by volume of said blank, placing said strontium titanate blank on a surface of a supporting substrate, depositing solid electrolyte on the face of said strontium titanate blank in an amount suffi-

cient when molten to fill the pore volume of said blank, said strontium titanate being selected from the group consisting of stoichiometric strontium titanate, strontium-rich titanate and mixtures thereof, said electrolyte being an alkali carbonate composition selected from the group consisting of a ternary lithium-potassium-sodium carbonates composition, a binary lithium-potassium carbonates composition, a binary lithium-sodium carbonates composition, a binary sodium-potassium carbonates composition and mixtures thereof, heating the resulting assembly to a temperature at least about 10° K. above the liquidus temperature of said electrolyte but at which it does not significantly vaporize whereupon the resulting molten electrolyte impregnates the blank advancing throughout the blank filling the pore volume therein so that the resulting electrolyte structure is at least substantially pore free when the electrolyte is in molten form, said heating being carried out in an atmosphere containing sufficient carbon dioxide to maintain the stability of said molten electrolyte, said substrate being chemically non-interactive with said molten electrolyte, said supporting substrate surface being shaped to allow residual gases to escape advancing molten electrolyte.

4,242,427

METHOD FOR IMPROVING WETTABILITY OF HIGH TEMPERATURE CELL SEPARATORS

Gerhard Sterr, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie, Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,219

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1978, 2851085

Int. Cl.³ H01M 2/16

U.S. Cl. 429—247 **6 Claims**

1. Method for improving the wettability of separators in electrochemical high temperature cells with molten electrolyte in which the separator consists of a temperature stable raw material, wherein

the surface of the separator is exposed at elevated temperature to the influence of boron trifluoride (BF_3) or a substance which yields BF_3.

4,242,428

ADDITIVE SYSTEM OF COLOR PHOTOGRAPHY BASED ON IRIDESCENT PIGMENTS

Chester Davis, 1685 Atson La., Cincinnati, Ohio 45205

Division of Ser. No. 738,449, Nov. 3, 1976, Pat. No. 4,184,872, which is a continuation-in-part of Ser. No. 549,707, Feb. 13, 1975, Pat. No. 4,010,293, and Ser. No. 549,706, Feb. 13, 1975, Pat. No. 4,065,158. This application Oct. 21, 1977, Ser. No. 844,373

Int. Cl.³ G03C 1/76

U.S. Cl. 430—9 **14 Claims**

8. An intensely colored, image layer comprising a composition which is a mixture of

particles of an iridescent pigment which displays an interference-reinforced reflection color, the particles of said pigment individually comprising an essentially transparent micaceous substrate having thereon at least one overcoating of an essentially transparent material having a refractive index greater than about 2.0

and finely divided silver particles,

said mixture dispersed in a binder.

4,242,429

METHOD OF STABILIZING ORGANIC SUBSTRATE MATERIALS AGAINST LIGHT

Hiroshi Hara, Asaka, and Yoshiaki Suzuki, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

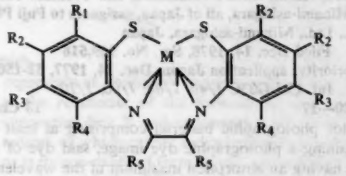
Filed Oct. 30, 1978, Ser. No. 955,840

Claims priority, application Japan, Nov. 1, 1977, 52-132274

Int. Cl.³ G03C 7/00

U.S. Cl. 430—17 **12 Claims**

7. A color photographic material comprising at least one layer containing a photographic dye image wherein said layer or an adjacent layer contains a compound of the formula (I) in an amount sufficient to stabilize said color photographic material to light:



(I)

wherein M represents a metal atom selected from the group consisting of Cu, Co, Ni, Pd and Pt atoms; R_1 R_2, R_3 and R_4 may be the same or different and represent a hydrogen atom, a cyano group, a halogen atom, an alkyl group, an aryl group, a cycloalkyl group or a heterocyclic group which may be substituted or unsubstituted and which may be attached to the carbon atom in the benzene ring directly or through a divalent connecting group; or each of R_1 and R_2, and R_3, or R_3 and R_4 may combine to form the atomic group necessary to complete a 6-membered ring and R_5 represents a hydrogen atom or a methyl group.

4,242,430

METHOD FOR STABILIZING ORGANIC SUBSTRATE MATERIALS INCLUDING PHOTOGRAPHIC DYE IMAGES AGAINST LIGHT

Hiroshi Hara, Asaka; Kotaro Nakamura, and Yoshiaki Suzuki, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

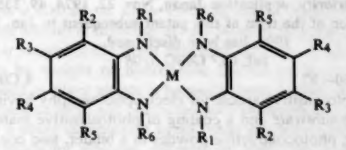
Filed Nov. 14, 1978, Ser. No. 960,548

Claims priority, application Japan, Nov. 22, 1977, 52-140321

Int. Cl.³ G03C 7/00

U.S. Cl. 430—17 **14 Claims**

6. A color photographic material comprising at least one layer containing a photographic dye image wherein said layer or adjacent layer contains a compound of the formula (I) in an amount sufficient to stabilize said color photographic material against the action of light while not adversely affecting color hue as well as color purity of the color photographic material



(I)

wherein M represents a Cu, Co, Ni, Pd or Pt atom; R_1 and R_6 are the same or different, and represent a hydrogen atom or an alkyl group, an aryl group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylsulfonyl group, or an arylsulfonyl group; R_2, R_3, R_4 and R_5 which may be the same or different represent a hydrogen atom, a halogen atom,

a cyano group, or an alkyl group, an aryl group, a cycloalkyl group or a heterocyclic group bonded to a carbon atom on the benzene rings either directly or through a divalent linking group, or R_2 and R_3, R_3 and R_4 or R_4 and R_5 may combine to form the non-metallic atomic groupings necessary to form a 6-membered ring.

4,242,431
METHOD FOR STABILIZING ORGANIC SUBSTRATE MATERIALS INCLUDING PHOTOGRAPHIC DYE IMAGES TO LIGHT AND A PHOTOGRAPHIC MATERIAL SO STABILIZED

Hiroshi Hara, Asaki; Kotaro Nakamura, and Yoshiaki Suzuki, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 14, 1978, Ser. No. 969,518
Claims priority, application Japan, Dec. 14, 1977, 52-15034
Int. Cl.³ G03C *1/40, 1/84, 7/00, 1/10*
U.S. Cl. 430—17 **13 Claims**

6. A color photographic material comprising at least one layer containing a photographic dye image, said dye of said dye image having an absorption maximum in the wavelength range between about 300 nm and about 800 nm, wherein said layer or an adjacent layer thereto contains at least one compound represented by the formula I

wherein M represents Ni, Pd or Pt; R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylsulfonyl group, an arylsulfonyl group or a carbamoyl group, stabilizing said dye to the action of light.

4,242,432
PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY HAVING PHOTOSENSITIVE MULTI-LAYERS

Akira Kato; Akira Itoh, and Tohru Uchida, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

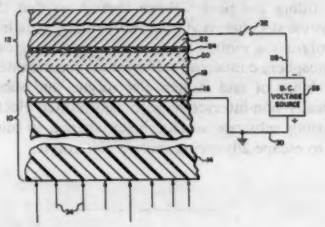
Continuation of Ser. No. 630,412, Nov. 10, 1975, Pat. No. 4,070,185. This application Aug. 1, 1977, Ser. No. 821,297
Claims priority, application Japan, Nov. 22, 1974, 49/135295
The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.
Int. Cl.² G03G *5/08*
U.S. Cl. 430—57 **4 Claims**

1. A photosensitive article for electrophotography having a conductive substrate and a coating of photosensitive material comprising photoconductive powder in a binder, said coating comprising at least two superimposed photosensitive layers wherein each layer contains photoconductive powder in a binder, the particle size of said photoconductive powder in the layer adjacent to the substrate being smaller than 0.5 microns and the particle size of the photoconductive powder in the superimposed outer layer being in the range of 0.5 microns to 3 microns.

4,242,433
HIGH SPEED ELECTROPHOTOGRAPHIC MEDIUM

Manfred R. Kuehnle, Lexington, and Arno K. Hagenlocher, Framingham, both of Mass., assignors to Coulter Systems Corp., Bedford, Mass.

Division of Ser. No. 796,054, May 12, 1977, Pat. No. 4,155,640.
This application Nov. 16, 1977, Ser. No. 851,822
Int. Cl.² G03G *5/04*
U.S. Cl. 430—67 **11 Claims**



1. An electrographic medium adapted to be imaged by a particular type of radiant energy to achieve at least a latent electric charge image of a pattern of said radiant energy, said medium comprising:

A. a modulating structure consisting of:
   i. a substrate that is transparent to said radiant energy,
   ii. an ohmic layer of a thin film material deposited onto a surface of said substrate in a thickness to be transparent to said radiant energy, and
   iii. a thin film photoconductive layer of a wholly inorganic, microcrystalline, uniformly ordered and vertically oriented crystallite, dense material having a dark resistivity of at least about 10^{12} ohm centimeters, a ratio of dark to light resistivity of at least about 10^4, a thickness of a degree to enable the transmission of said radiant energy with less than about 30% absorption of white light, said crystalline layer being bonded to the surface of said ohmic layer opposite the substrate,

B. a storage structure consisting of
   i. a layer of dielectric material that is highly insulating electrically, intimately and permanently bonded to the surface of the photoconductive layer opposite the ohmic layer,
   ii. an electrode overlying the dielectric layer on the surface opposite the photoconductive layer, and
   iii. an interfacing, intimately connecting conductive film between the electrode and the dielectric layer, said film being of a nature to enable ready separation of the electrode from the dielectric layer,

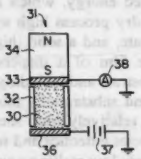
C. means for extending a connection from each of said ohmic layer and electrode to a relatively low voltage d.c. source and

D. said electrophotographic medium adapted to have said pattern projected against the bottom of the substrate, through the substrate and ohmic layer and into said photoconductive layer whereby selectivity to release charge carriers for modulated movement through said photoconductive layer to effect the synthesization of said projected pattern onto the surface of the photoconductive layer opposite the ohmic layer and thence by induction through and onto the surface of said dielectric layer.

4,242,434
TONER COMPOSITION FOR MULTIPLE COPY ELECTROSTATIC PHOTOGRAPHY

Koji Hirakura; Itsuo Ikeda; Wasaburo Ohta, and Zenjiro Okuno, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 742,732, Nov. 17, 1976, abandoned.
This application Jun. 21, 1978, Ser. No. 917,708
Claims priority, application Japan, Nov. 26, 1975, 50/141364
Int. Cl.[3] G03G 9/14, 15/09
U.S. Cl. 430—122 20 Claims



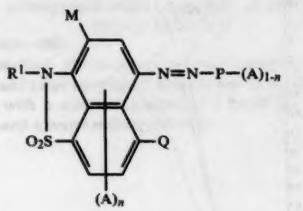
1. In a method of controlling the operation of an electrostatic apparatus to produce a large number of copies from an electrostatic image in a multiple copy process, the electrostatic apparatus being of the type comprising a photoconductive member, imaging means for radiating a light image onto the photoconductive member, developing means including a magnetic brush for applying a dry toner substance onto the surface of the photoconductive member and forming a toner image thereon, and means for transferring the toner image onto the paper to thereby reproduce a copy of the image, the method comprising utilizing a toner substance comprising a magnetic carrier composition, providing an effective conductivity of between 10^{-15} and 10^{-5} ohms^{-1} cm^{-1} for the magnetic carrier composition, each particle of the composition comprising a ferromagnetic material and a resin and having a diameter between 20 and 200 microns , and determining the effective conductivity by testing means separate from the electrostatic apparatus such that the effective conductivity is measured while the composition is free of absorbed water vapor and other gases encountered under operating conditions with the electrostatic apparatus, said effective conductivity being determined by disposing said magnetic carrier composition in a cell in which an electrode is disposed at the top thereof, retaining said magnetic carrier composition in said cell by a magnet disposed above said electrode thereby substantially simulating said magnetic brush, and measuring the electric current passing through said magnetic carrier composition in said cell utilizing said electrode and another electrode at the bottom of said cell and a power source, whereby said measurement is utilized to determine said effective conductivity of said magnetic carrier composition.

4,242,435
PHOTOGRAPHIC DYE DIFFUSION TRANSFER PROCESS

Walter Püschel, Leverkusen; Hans Vetter, Cologne, and Paul Marx, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 10,512
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806196
Int. Cl.[3] G03C 5/54, 7/00, 1/40, 1/10
U.S. Cl. 430—242 2 Claims

1. In a photographic dye diffusion transfer process for the production of coloured images, in which a photographic material comprising at least one photosensitive silver halide emulsion layer and, associated therewith, a non-diffusible dye-providing compound is exposed imagewise, developed under alkaline conditions with a silver halide developer, a diffusible dye being released imagewise from the non-diffusible dye-providing compound under the alkaline development conditions of the developer and being transferred to an image-receiving layer and thereafter neutralizing the alkaline condition thereby terminating development and diffusion of the dye, the improvement according to which the non-diffusible dye-providing compound is a compound corresponding to the following formula:



I

in which

A represents an oxidizable organic carrier radical attached to the remainder of the formula optionally through a connecting link X and containing a diffusion-preventing radical, of which carrier radical either in its oxidized form or in its non-oxidized form at least a part thereof is split off together with the diffusion-preventing radical under the alkaline photographic development conditions, accompanied by the imagewise release of a diffusible azo dye,

n=0 or 1,

P represents a monocyclic carbocyclic aromatic or heterocyclic aromatic radical,

M represents hydrogen, halogen, alkyl sulfonyl, aryl sulfonyl, or sulphamoyl,

Q represents acylamino, the acyl radical being derived from aliphatic or aromatic carboxylic or sulphonic acids,

R^1 represents hydrogen or a hydrolysable radical corresponding to one of the formulae —CO—R^2 or —CO—OR^2, and

R^2 represents alkyl containing from 1 to 18 carbon atoms or phenyl.

4,242,436
PHOTOGRAPHIC MATERIAL FOR CONTINUOUS TONE REPRODUCTION

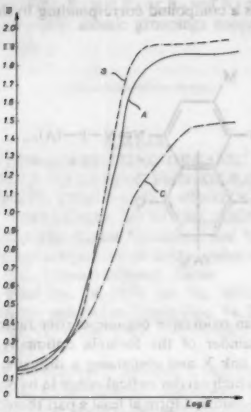
Ludovicus M. Mertens, Antwerp, and Leon L. Vermeulen, Herenthout, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 7, 1978, Ser. No. 958,386
Claims priority, application United Kingdom, Dec. 15, 1977, 52264/77
Int. Cl.[2] G03C 5/54, 1/48
U.S. Cl. 430—248 5 Claims

1. A process for producing an image in an image-receiving layer by a silver complex diffusion transfer process in which a photographic material comprising at least one water-permeable layer and including a water-permeable hydrophilic colloid silver halide emulsion layer in which the silver halide comprises a mixture of silver chloride and at least one of silver iodide and silver bromide, at least 90 mole % based on the total molar weight of the silver halide being silver chloride, and the ratio by weight of hydrophilic colloid to silver halide expressed as silver nitrate is between about 3:1 and about 10:1 is exposed to light, and contacted with an aqueous alkaline liquid and a silver complexing agent while in contact with said image-receiving material, wherein at least one of said photographic material layers contains a mixture of developing agents comprising an o-dihydroxybenzene and a 3-pyrazolidinone, the molar amount of the o-dihydroxybenzene in said mixture being larger than the molar amount of the 3-pyrazolidinone.

2. A process according to claim 1, wherein the silver complex diffusion transfer process is carried out with an alkaline

aqueous processing liquid containing thiosulphate ions in admixture with iodide ions and an organic heterocyclic mercapto



compound cooperating with the iodide ions in the producing of an image with brown or sepia tone.

4,242,437

PHOTOSENSITIZED POLYAMIC ACIDS CURABLE BY EXPOSURE TO ACTINIC RADIATION

Robert R. Rohloff, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 11, 1979, Ser. No. 38,061
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—270 **2 Claims**

1. A light sensitive article comprising a film of polyamic acid containing at least one photoinitiator therein capable of aiding in the cure of said polyamic acid upon exposure thereof to actinic radiation.

4,242,438

PHOTOMASK MATERIAL

Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 8, 1975, Ser. No. 611,115
Claims priority, application Japan, Sep. 6, 1974, 49/102795
Int. Cl.² G03C *1/74*
U.S. Cl. 430—278 **16 Claims**

1. A photomask material which comprises an transparent support which is a plate or film of glass, natural or synthetic mineral, or synthetic resin, having thereon a transparent electroconductive layer comprised of gold, platinum, palladium, tin (IV) oxide or indium (III) oxide and having a thickness ranging from about 0.005 to 0.06μ and a surface electric resistivity of about 10^6 ohm square or less, said electroconductive layer having thereon a transparent porous aluminum oxide layer formed by anodic oxidation, said aluminum oxide layer having a thickness of from about 1.5 to 30μ and containing over the entire layer a uniform distribution of fine pores ranging in size from 200 to 1000 A with a light-sensitive silver halide incorporated therein.

4,242,439

DISPERSION IMAGING UTILIZING PLURAL LAYERS OF DIFFERENT METAL COMPONENTS

Masatsugu Izu, Birmingham, and Vincent D. Cannella, Detroit, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 827,470, Aug. 25, 1977. This application Sep. 27, 1979, Ser. No. 79,377
Int. Cl.³ G03C *5/24, 5/04*
U.S. Cl. 430—346 **14 Claims**

1. The method of producing an image by a dry process with a minimum of applied energy, which method comprises the step of providing a dry process high sensitivity imaging film comprising, a substrate, and a solid, high optical density and substantially opaque film of a dispersion imaging material deposited on said substrate and including a pluraltiy of separate layers of different and substantially mutually insoluble metal components having relatively high melting points and relatively low melting point eutectics and interfaces between said layers having relatively low melting points, said film of dispersion imaging material, upon application of energy in an amount above a certain critical value sufficient to increase the absorbed energy in the film material above a certain critical temperature value related to the relatively low melting points of the interfaces, changing to a substantially fluid state in which the surface tension of the film material acts to cause the substantially opaque film, where subject to said energy, to disperse and change to a discontinuous film comprising openings and deformed material which are frozen in place following said application of energy and through which openings light can pass for decreasing the optical density thereat, and the step of applying to said substantially opaque film of dispersion imaging material energy in an amount above said certain critical value sufficient to increase the absorbed energy in the film material above said certain critical temperature value related to the relatively low melting points of the interfaces to disperse and change the substantially opaque film, where subjected to said applied energy, to a discontinuous film comprising openings and deformed material which are frozen in place following said application of energy and through which openings light can pass for decreasing the optical density thereat.

4,242,440

THERMOCHROMIC POLYACETYLENES USED IN LASER BEAM RECORDING METHOD

Kwok C. Yee, Randolph; Anthony F. Preziosi, Ledgewood; Gordhanbhai N. Patel; Ronald R. Chance, both of Morris Plains; Granville G. Miller, Morristown, and Ray H. Baughman, Morris Plains, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

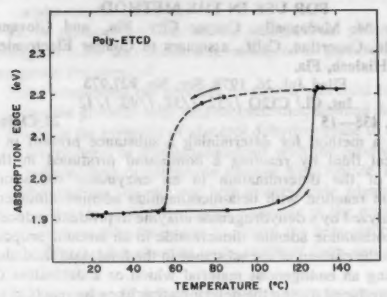
Division of Ser. No. 839,678, Oct. 5, 1977. This application Apr. 30, 1979, Ser. No. 34,111
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—346 **2 Claims**

1. In a process for laser beam recording of images which are storable and erasable comprising the steps of

(a) generating a laser beam; and

(b) exposing to said beam a thermochromic layer on a substrate, thereby forming an image by the resulting heating of the thermochromic layer above its thermochromic transition temperature, the improvement which comprises forming said layer from at least one thermochromic polyacetylene, formed by polymerizing an acetylenic compound containing at least one —C≡C—C≡C— group, wherein the thermochromic polyacetylene possesses a hysteresis transition temperature which is at least about 5° C. below its thermochromic transition temperature and maintaining said layer after exposure between the ther-

mochromic transition temperature and hysteresis transition temperature to store the image or cooling said layer



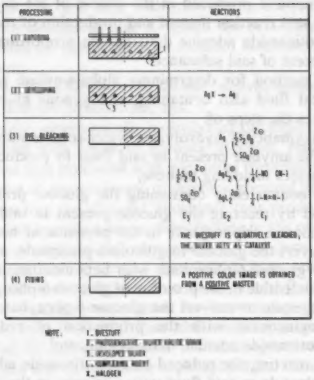
below the hysteresis transition temperature to erase the image.

4,242,441

COLOR IMAGE FORMING PROCESS

Shigeru Nakamura, and Isao Shimamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 840,459, Oct. 7, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,694
Claims priority, application Japan, Oct. 12, 1976, 51-122577
Int. Cl.³ G03C *7/00*
U.S. Cl. 430—390 **12 Claims**



1. A posi-posi process for forming positive color images which comprises processing an image-wise exposed and developed photographic element having silver image-wise distributed therein in the presence of a heterocyclic compound containing at least one nitrogen atom in the heterocyclic nucleus thereof, which exhibits an oxidation reduction potential of Ag(I)/Ag(II) in the range of about 1.9 volts to about 1.1 volts, a peroxo acid or a salt thereof, and a dye, to oxidatively bleach the dye at a pH of 2 to 7 at the areas where silver is present due to the catalytic effect of said silver on the oxidation of said dye, whereby said positive color images are formed.

4,242,442

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yoshio Idota, and Minoru Yamada, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 19, 1979, Ser. No. 86,623
Claims priority, application Japan, Oct. 19, 1978, 53-128883
Int. Cl.³ G03C *5/32*
U.S. Cl. 430—393 **25 Claims**

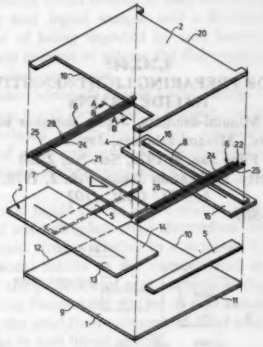
1. A method which comprises processing an imagewise exposed and color developed silver halide color photographic material with a solution containing a ferric ion complex, a bromate and a water-soluble chloride.

4,242,443

PHOTOGRAPHIC FILM UNIT WITH INTEGRAL STRUCTURE

Hermann Lübrig, Leverkusen; Guido Kovacic, Unkel, and Horst-Peter Müller, Cologne, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,192
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843476
Int. Cl.³ G03C *1/48*
U.S. Cl. 430—496 **15 Claims**



1. A photographic film unit having an integral structure with a front and a rear end and a picture sheet and a covering sheet which are joined to each other by means of an interposed mask, wherein a container for photographic developer material is located at the front end of the picture unit and a trap for collecting excess developer material is located at the rear end of the picture unit the mask having elongate flap members which initially project out of the contour of the picture unit and are then folded back on to the covering sheet and are rigidly joined with it, the flap members covering the container and the trap, characterised in that the film unit has lateral connections between picture sheet and covering sheet disposed between the trap and the container and spacer strips with air guiding channels are disposed in the lateral connections.

4,242,444

PROCESS FOR THE PREPARATION OF LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Teiji Habu; Masao Ishihara; Sadatugu Terada; Eiichi Sakamoto, and Hiroshi Yamada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 921,102
Claims priority, application Japan, Jul. 4, 1977, 52-79647
Int. Cl.[3] G03C *1/78, 1/02, 1/38*
U.S. Cl. 430—510 12 Claims

1. A process for the preparation of a photographic element comprising a support and a photographic layer thereon, said photographic layer containing a silver halide layer, said process comprising applying to said element a coating solution which contains a compound represented by the following formula (I) or (II):

$$C_{3n}F_{(6n)-1}—Y—A—B \quad (I)$$

$$C_{3n}F_{(6n)-1}—Y—A—X—A—Y—C_{3n}F_{(6n)-1} \quad (II)$$

wherein A represents a simple bond or a divalent group; Y represents oxygen or sulfur, or

$$—N(R_1)—A'—;$$

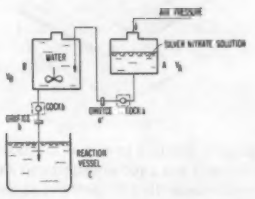
B represents a monovalent hydrophilic group; X represents a divalent hydrophilic group; n represents an integer of 1 to 4; R_1 represents hydrogen, a lower alkyl group; and A′ represents a simple bond or an alkylene group.

4,242,445

METHOD FOR PREPARING LIGHT-SENSITIVE SILVER HALIDE GRAINS

Mitsuo Saito, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 9, 1979, Ser. No. 2,134
Claims priority, application Japan, Feb. 2, 1978, 53-10681
Int. Cl.[3] G03C *1/02*
U.S. Cl. 430—569 13 Claims



1. A method of preparing light-sensitive silver halide grains by the simultaneous addition of two or more aqueous solutions of inorganic salts in the presence of a protective colloid to form a reaction mixture which comprises providing nuclei of silver halide grains at the initial stage of grain formation and growing said grains while increasing the concentrations of said aqueous solutions of said inorganic salts without increasing the concentrations of said inorganic salts in said reaction mixture such that fresh nuclei of crystal grains are hardly produced during the period of grain growth.

4,242,446

METHOD FOR DETERMINING A SUBSTANCE IN A BIOLOGICAL FLUID AND REAGENT COMBINATION FOR USE IN THE METHOD

Mathew M. Madappally, Cooper City, Fla., and Giovanni Bucolo, Cupertino, Calif., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jul. 26, 1978, Ser. No. 927,973
Int. Cl.[3] C12Q *1/52, 1/34, 1/40, 1/32*
U.S. Cl. 435—15 21 Claims

1. In a method for determining a substance present in a biological fluid by reacting a compound produced in the course of the determination in an enzymatic oxidation-reduction reaction with beta-nicotinamide adenine dinucleotide catalyzed by a dehydrogenase enzyme to produce reduced beta-nicotinamide adenine dinucleotide in an amount proportional to the content of the substance in the fluid, said fluid also containing an endogenous material which or a derivative of which produced during the determination likewise reacts in an enzymatic oxidation-reduction reaction with beta-nicotinamide adenine dinucleotide catalyzed by said dehydrogenase to produce reduced beta-nicotinamide adenine dinucleotide, thereby interfering with the determination, the improvement for obviating the interference caused by the endogenous material which comprises:

reacting said endogenous material or derivative thereof present in said fluid in an enzymatic oxidation-reduction reaction with beta-nicotinamide adenine dinucleotide catalyzed by said enzyme dehydrogenase to subtantially consume the endogenous material or derivative by conversion thereof to an oxidation product of the reaction with the production of reduced beta-nicotinamide adenine dinucleotide,

reacting the resulting reduced beta-nicotinamide adenine dinucleotide in said fluid with pyruvate in the presence of lactate dehydrogenase to return the reduced beta-nicotinamide adenine dinucleotide to its oxidized form with the reduction of pyruvate to lactate,

thereafter inhibiting the lactate dehydrogenase enzymatic activity in said fluid,

and thereafter producing in said fluid a quantity of said compound produced in the course of the determination for said reaction thereof and production of reduced beta-nicotinamide adenine dinucleotide proportionally to the content of said substance.

4. A method for determining alpha-amylase present in a biological fluid also containing endogenous glucose, which comprises the steps of:

(1) enzymatically hydrolyzing water-soluble starch with the alpha-amylase present in said fluid to produce oligosaccharides including maltose,

(2)(a) concurrently consuming the glucose present in said fluid by reacting the glucose present in said fluid with adenosine triphosphate in the presence of hexokinase to convert the glucose to glucose-6-phosphate, and reacting the glucose-6-phosphate with beta-nicotinamide adenine dinucleotide in the presence of glucose-6-phosphate dehydrogenase to convert the glucose-6-phosphate to 6-phosphogluconate with the production of reduced beta-nicotinamide adenine dinucleotide, and

(b) reacting the reduced beta-nicotinamide adenine dinucleotide in said fluid with pyruvate in the presence of lactate dehydrogenase to return the beta-nicotinamide adenine dinucleotide to its oxidized form and produce lactate,

(3) thereafter inhibiting the lactate dehydrogenase enzymatic activity in said fluid, and

(4) thereafter continuing said hydrolysis with the amphaamylase present in said fluid, enzymatically hydrolyzing the maltose produced in the presence of alpha-glucosidase to produce glucose, reacting the glucose thus produced with adenosine triphosphate in the presence of hexokinase to produce glucose-6-phosphate, and reacting the glucose-6-phosphate thus produced with beta-nicotinamide ade-

nine dinucleotide in the presence of glucose-6-phosphate dehydrogenase to produce reduced beta-nicotinamide adenine dinucleotide in an amount proportional to the alpha-amylase activity.

11. A method for determining triglycerides present in a biological fluid also contacting endogenous glycerol, which comprises the steps of:

(1)(a) consuming the glycerol present in said fluid by reacting the glycerol with beta-nicotinamide adenine dinucleotide in the presence of glycerol dehydrogenase to convert the glycerol to dihydroxyacetone with the production of reduced beta-nicotinamide adenine dinucleotide, and

(b) reacting the reduced beta-nicotinamide adenine dinucleotide in said fluid with pyruvate in the presence of lactate dehydrogenase to return the beta-nicotinamide adenine dinucleotide to its oxidized form and produce lactate,

(2) thereafter inhibiting the lactate dehydrogenase enzymatic activity in said fluid, and

(3) thereafter enzymatically hydrolyzing the triglycerides in said fluid with lipase to produce glycerol, and reacting the glycerol thus produced with beta-nicotinamide adenine dinucleotide in the presence of glycerol dehydrogenase to produce reduced beta-nicotinamide adenine dinucleotide in an amount proportional to the triglyceride content of said fluid.

14. A method for determining triglycerides present in a biological fluid also containing endogenous glycerol, which comprises the steps of:

(1)(a) consuming the glycerol present in said fluid by reacting the glycerol with adenosine triphosphate in the presence of glycerokinase to convert the glycerol to glycerol phosphate, reacting the glycerol phosphate with beta-nicotinamide adenine dinucleotide in the presence of glycerophosphate dehydrogenase to convert the glycerol phosphate to dihydroxyacetone phosphate with the production of reduced beta-nicotinamide adenine dinucleotide, and

(b) reacting the reduced beta-nicotinamide adenine dinucleotide in said fluid with pyruvate in the presence of lactate dehydrogenase to return the beta-nicotinamide adenine dinucleotide to its oxidized form and produce lactate,

(2) thereafter inhibiting the lactate dehydrogenase enzymatic activity in said fluid, and

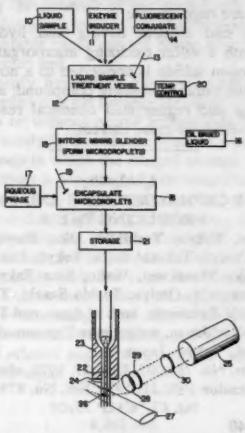
(3) thereafter enzymatically hydrolyzing the triglycerides in said fluid with lipase to produce glycerol, reacting the glycerol thus produced with adenosine triphosphate in the presence of glycerokinase to produce glycerol phosphate, and reacting the glycerol phosphate thus produced with beta-nicotinamide adenine dinucleotide in the presence of glycerophosphate dehydrogenase to produce reduced beta-nicotinamide adenine dinucleotide in an amount proportional to the triglyceride content of said fluid.

19. A two-reagent assay system for determining alpha-amylase present in a biological fluid also containing endogenous glucose, which system includes a first reagent comprising water-soluble starch, adenosine triphosphate, hexokinase, beta-nicotinamide adenine dinucleotide, glucose-6-phosphate dehydrogenase, a water-soluble salt of pyruvic acid, and lactate dehydrogenase, said first reagent to be admixed with said fluid initially for hydrolysis of starch and conversion of glucose present to 6-phosphogluconate in a product containing the beta-nicotinamide adenine dinucleotide in its oxidized form, and a second reagent comprising a water-soluble salt of oxamic acid and alpha-glucosidase, said second reagent to be admixed with said product for inhibiting the enzymatic activity of said lactate dehydrogenase and then producing reduced beta-nicotinamide adenine dinucleotide in an amount proportional to the alpha-amylase activity.

4,242,447
RAPID DETECTION OF BACTERIA

Eugene Findl, Amityville, and Leonard D. Kurtz, Woodmere, both of N.Y., assignors to BioResearch, Farmingdale, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,622
Int. Cl.[3] C12Q 1/06
U.S. Cl. 435—39 15 Claims



1. A method of rapidly detecting and quantifying bacteria present in a liquid sample comprising the steps of:

admixing with a liquid sample to be tested for the presence of bacteria an enzyme-producing agent which induces the production of an enzyme in said bacteria, said enzyme being capable of reacting with a fluorescent conjugate ingested by said bacteria to release the fluorescent portion thereof, to induce production of said enzyme in an amount sufficient to effect release of said fluorescent portion;

admixing said liquid sample and a fluorescent conjugate capable of being ingested by said bacteria for reaction with said enzyme to release the fluorescent portion of said fluorescent conjugate;

forming microdroplets of said liquid sample encapsulated by a oil base liquid membrane in a liquid carrier, in which said encapsulated microdroplet are substantially insoluble, each of said encapsulated microdroplets retaining the fluorescent matter released from said fluorescent conjugate;

forming said liquid carrier into a stream such that the encapsulated microdroplets align themselves therein; and

moving said stream relative to a detector for detecting the fluorescent matter in the encapsulated microdroplets to detect the presence of said bacteria in the liquid sample, detecting fluorescent matter in said microdroplets, measuring the total fluorescence and determining the bacterial content in said liquid sample.

4,242,448
REGENERATION OF SCRUBBER EFFLUENT CONTAINING SULFATE RADICALS

Robert S. Brown, III, 9726 Cedar Dr., Shawnee Mission, Kans. 66207

Filed Apr. 12, 1979, Ser. No. 29,272
Int. Cl.[3] C12P 39/00, 3/00; C10G 32/00
U.S. Cl. 435—42 9 Claims

1. A process for scrubbing sulfur dioxide from stack gas of fossil fuel burning including the steps of:

(a) passing said stack gas through a scrubber vessel;

(b) injecting a solution into said scrubber vessel contemporaneously with said stack gas; said solution having chemical reactants therein; said chemical reactants substantially

reacting with said sulfur dioxide and forming inorganic, non-gaseous, and reducible sulfur containing compounds therewith; said reducible sulfur containing compounds being ejected from said scrubber in a liquid effluent thereby removing said sulfur dioxide from said stack gas;

(c) treating said reducible sulfur containing compounds with a sulfur reducing microorganism, whereby hydrogen sulfide is produced in said effluent and said chemical reactants are regenerated;

(d) treating said effluent having said hydrogen sulfide therein with a sulfur oxidizing microorganism whereby said hydrogen sulfide is converted to a non-noxious and non-gaseous sulfur containing compound; and

(d) returning said regenerated chemical reactants to said scrubber vessel for reuse therein.

4,242,449

7-METHOXY CEPHALOSPORINS AND PROCESS OF PRODUCING THEM

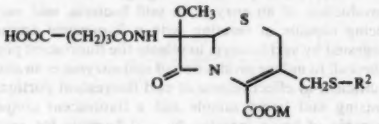
Takashi Osono, Tokyo; Yoshihiko Oka, Kawagoe; Shunichi Watanabe, Omiya; Takeshi Saito, Tokyo; Hiroshi Gushima, Ageo; Keisuke Murakami, Wako; Isao Takahashi, Tokyo; Hiroshi Yamaguchi, Omiya; Toshio Sasaki, Tokyo; Kiyoshi Susaki; Shuichi Takamura, both of Ageo, and Toshiaki Miyoshi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 754,007, Dec. 27, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,786

Int. Cl.³ C12P *35/08*

U.S. Cl. 435—48 **17 Claims**

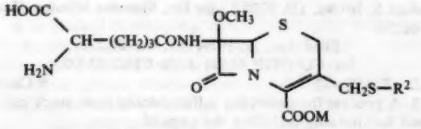
1. A process of producing 7-(4-carboxybutyramido)-7-methoxycephalosporin derivatives represented by the formula



wherein R^2 represents a nitrogen-containing heterocyclic group selected from the group consisting of 5-carboxymethylthio-1,3,4-thiodiazol-2,yl,1-methyl-1H-tetrazol-5-yl,5-methyl-1,3,4-thiadiazol-2-yl, and 1,3,4-thiadiazol-2-yl, and M represents a hydrogen atom or organic or inorganic residue selected from the group consisting of alkali metals, alkaline earth metals, heavy metals, and bases forming quaternary salts or amine salts which comprises cultivating a 7-methoxycephalosporin antibiotic producing microorganism belonging to the genus Streptomyces in a culture medium containing nutrients with the addition of a heterocylic thiol represented by the formula

R^2SH

wherein R^2 has the same meaning as above, or a salt of the heterocyclic thiol, or further a compound capable of being converted into said heterocyclic thiol during cultivation to produce 7-methoxycephalosporin derivatives represented by the formula



wherein R^2 and M have the same meaning as above, and then contacting the compound with the mycelium of the D-amino acid oxidizing enzyme producing microorganism *Trigonopsis variables*, the cell-free extract of said mycelium or the activated mycelium of said microorganisms under aerobic conditions.

4,242,450

METHOD OF HYDROLYZING SUGAR, PROTEIN OR THE LIKE AND APPARATUS THEREFOR

Yoshihiko Honda, Hidaka; Masanobu Koutake, Kodaira; Hidege Kanazawa, Kiyose; Taisuke Iwasaki, Hino; Shozo Ohba, Sayama; Honoh Hashiba, Tokorozawa, and Gosei Kawanishi, Ichikawa, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Aug. 10, 1979, Ser. No. 65,439

Claims priority, application Japan, Sep. 6, 1978, 53-109260

Int. Cl.³ C12M *1/40;* **C12P** *1/00*

U.S. Cl. 435—69 **14 Claims**

1. A method of hydrolyzing an enzyme hydrolyzable substrate which comprises jet-dispersing through an orifice and a net a constant-temperature aqueous solution containing a substrate hydrolyzable with enzyme and making the same react in contact with a rotating immobilized enzyme under the hydrolyzable conditions.

4,242,451

METHOD OF TREATMENT OF FLOCCULATED HOMOGENATE OF MICROBIAL CELLS CONTAINING GLUCOSE ISOMERASE

Irving Ehrenthal, University City; Kenneth K. Shieh, St. Louis County; Barrett L. Scallet, Clayton, and Jagdish Rajpara, St. Louis, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 859,294, Dec. 12, 1977, abandoned. This application Oct. 25, 1979, Ser. No. 88,013

Int. Cl.³ C12P *19/24;* **C12N** *11/14*

U.S. Cl. 435—94 **21 Claims**

1. A method of immobilizing glucose isomerase cell material obtained from whole microbial cells of an organism of the genus Actinoplanes containing glucose isomerase comprising the steps of

a. disrupting a portion of whole microbial cells of the genus Actinoplanes containing glucose isomerase,

b. flocculating said disrupted glucose isomerase cell material,

c. adding a water absorbing smectite filler to said flocculated glucose isomerase cell material, and

d. forming the mixture of glucose isomerase cell material and the water absorbing smectite filler into discrete particles.

4,242,452

PROCESS FOR PREPARING N-CARBAMOYL-D-THIENYLGLYCINES

Hideaki Yamada, Kyoto; Satomi Takahashi, Kobe, and Koji Yoneda, Amagasaki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 9, 1979, Ser. No. 18,876

Claims priority, application Japan, Mar. 15, 1978, 53/30062

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.³ C12P *17/00*

U.S. Cl. 435—117 **11 Claims**

1. A process for preparing N-carbamoyl-D-(2-thienyl or 3-thienyl)glycine which comprises subjecting 5-(2-thienyl or 3-thienyl)hydantoin to the action of an enzyme which is in the form of a cultured broth containing microorganisms or the separated cells of said microorganisms in an aqueous medium, said enzyme being capable of hydrolyzing 5-(2-thienyl or 3-thienyl)hydantoin so as to substantially produce only D-form of N-carbamoyl(2-thienyl or 3-thienyl)glycine, and recovering N-carbamoyl-D-(2-thienyl or 3-thienyl)glycine from the medium.

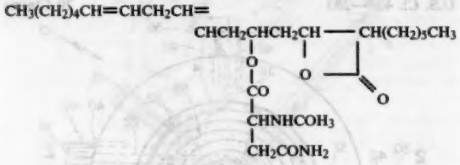
4,242,453

CULTIVATING STREPTOMYCES TO PRODUCE AN ESTERASE INHIBITOR

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Hoya, and Masaaki Ishizuka, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 873,350, Jan. 30, 1978, Pat. No. 4,189,438. This application May 14, 1979, Ser. No. 39,094
Claims priority, application Japan, Feb. 8, 1977, 52/12119
Int. Cl.[3] C12P *17/02*
U.S. Cl. 435—123 4 Claims

1. The process for the production of the compound having the formula



denominated esterastin, which comprises cultivating an esterastin-producing strain of *Streptomyces lavendulae* having the identifying characteristics of A.T.C.C. 31336 under submerged aerobic conditions in a nutrient medium containing assimilable carbon and nitrogen sources for a period of time sufficient to produce a substantial amount of esterastin in the culture medium and recovering esterastin from said medium.

4,242,454

FERMENTATION PROCESS

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed May 29, 1979, Ser. No. 43,190
Int. Cl.[3] C12P *7/14*
U.S. Cl. 435—162 11 Claims

1. A process for the production of ethanol by continuous fermentation which comprises carrying out fermentation upon an aqueous solution of fermentable sugar in a series of fermentation vessels in which the ethanol content of the fermentation medium is progressively increased in each fermentation vessel as the fermentable sugar is consumed therein, the fermentation employing at least two different strains of ethanol-producing yeast,one of which provides a high rate of ethanol production in a fermentation medium containing a relatively low concentration of ethanol and a relatively high concentration of sugar and the other of which provides a high rate of ethanol production in a fermentation medium containing a relatively high concentration of ethanol and a relatively low concentration of fermentable sugar.

4,242,455

PROCESS FOR THE ACID HYDROLYSIS OF CARBOHYDRATE POLYMERS AND THE CONTINUOUS FERMENTATION OF THE SUGARS OBTAINED THEREFROM TO PROVIDE ETHANOL

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 52,038
Int. Cl.[3] C12P *7/14*
U.S. Cl. 435—162 18 Claims

1. A process for the acid hydrolysis of carbohydrate polymer and the continuous fermentation of the fermentable sugars therefrom to provide ethanol which comprises:

(a) substantially uniformly mixing a pressurized acidified aqueous slurry of carbohydrate polymer particles with relatively high pressure stream;

(b) passing the acidified carbohydrate polymer slurry through a conduit under substantially steady state temperature and pressure for a period sufficient to convert at least about 60% by weight of the carbohydrate polymer to fermentable sugar but without appreciable conversion of carbohydrate polymer to non-fermentable products;

(c) reducing the pressure of the hydrolyzed carbohydrate polymer slurry to a level at which undesirable reactions of the fermentable sugar present in solution therein cannot readily occur; and,

(d) continuously fermenting the fermentable sugar, previously adjusted to a pH suitable for carrying out fermentation, with or without partial hydrolysate therein having been previously further saccharified, in a series of fermentation vessels in which the ethanol content of the fermentation medium is progressively increased in each fermentation vessel as the fermentable sugar is consumed therein, the fermentation employing at least two different strains of ethanol-producing yeast, one of which provides a high rate of ethanol production in a fermentation medium containing a relatively low concentration of ethanol and a relatively high concentration of sugar and the other of which provides a high rate of ethanol production in a fermentation medium containing a relatively high concentration of ethanol and a relatively low concentration of fermentable sugar.

4,242,456

RADIOENZYMATIC ASSAY OF CATECHOLAMINES

Garland A. Johnson, Charleston Township, Kalamazoo County, and Jacob D. Peuler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 681,999, Apr. 30, 1976, abandoned. This application Oct. 12, 1978, Ser. No. 950,862
Int. Cl.[2] C12N *9/10*
U.S. Cl. 435—193 4 Claims

1. A method for increasing the intrinsic affinity of catechol-O-methyl transferase for compounds having the catechol nucleus which comprises incubating with catechol-O-methyl transferase a magnesium cation of oxidation number +2, glutathione, a mammalian system selected from the group consisting of the supernatant of deproteinized tissue homogenate, blood serum or plasma, and biological fluid, the methyl donor S-adenosyl-L-methionine (^{3}H) methyl and an enzyme activity increasing effective amount of ethylene glycol bis(aminoethylether)-N,N'tetraacetic acid, wherein the the transferase, magnesium, glutathione and methyl donor are present in quantities which permit substantially all the catechol nuclei to be O-methylated.

4,242,457

AUTOMATED VIRUS HARVESTING

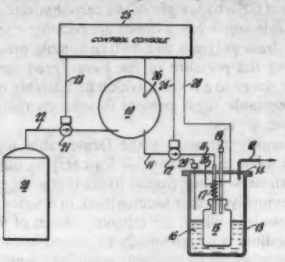
William J. McAleer, Ambler, and William M. Hurni, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 802,846, Jun. 2, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,494
Int. Cl.[3] C12N *7/00*
U.S. Cl. 435—235 6 Claims

1. In an apparatus for replicating a virus in cells growing on a surface in a viral growth tank wherein a plurality of viral harvests is removed from the viral growth tank with the cells remaining in the tank, and wherein fresh growth media is fed to the viral growth tank following each harvest except the last, the improvement comprising means for automatically removing substantially all of the viral harvest fluid from the viral growth tank at each of a predetermined plurality of times and automatically passing the fluid to a storage vessel maintained at about the temperature of liquid nitrogen and wherein at least part of the means for passing viral harvest fluid to the storage

vessel is provided with means to prevent freezing of harvest fluid.

5. A method of automatically harvesting a virus comprising growing a virus in cells growing on a surface in the presence of a growth medium in a viral growth propagator until the cell



growth cycle is completed, automatically discharging the growth medium at predetermined times when viral titer is at a maximum, and automatically collecting the viral growth medium at about the temperature of liquid nitrogen and wherein the collecting is performed under conditions which preclude premature freezing of viral growth medium.

4,242,458

BIOSYNTHESIS OF PROTEIN BY FERMENTATION OF METHANOL OBTAINED FROM THE GASIFICATION OF COAL OR RESIDUAL OIL

Edward T. Child, Tarrytown, and Robert M. Suggitt, Wappingers Falls, both of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,712

Int. Cl.[2] **C12N** *1/32, 1/36;* **C12R** *1/78*

U.S. Cl. 435—247 **6 Claims**

1. A process for the production of single cell protein which comprises the steps of:

(a) subjecting a carbonaceous fuel comprising a liquid hydrocarbon fuel of petroleum distillates or residua, naphtha, gas oil, residual fuel, reduced crude fuel oil, whole crude, coal tar oil, shale oil, coal liquefaction products and mixtures thereof, or solid fuels of petroleum coke, coal coke, anthracite, bituminous coal, lignite, or gaseous fuels of natural gas, to partial oxidation with an oxygen-containing material to produce a product gas containing carbon monoxide and hydrogen,

(b) passing a portion of the product gas from (a) also containing steam, into contact with a shift conversion catalyst for the production of a gas composed primarily of hydrogen,

(c) passing the remaining portion of the product gas from (a) to an acid gas scrubber to produce a purified stream of hydrogen and carbon monoxide,

(d) passing the purified stream of hydrogen and carbon monoxide from (c) into contact with a methanol synthesis catalyst for the production of methanol,

(e) subjecting air to rectification to produce a gas consisting essentially of oxygen and a separate gas consisting primarily of nitrogen,

(f) introducing a portion of the gas stream consisting essentially of oxygen from step (e) into the partial oxidation zone as supplemental oxygen therefor in step (a),

(g) introducing the gas consisting primarily of nitrogen from step (e) and the gas rich in hydrogen recovered from step (b) into an ammonia synthesis reactor to produce a gas rich in ammonia,

(h) introducing the methanol product in step (d), the ammonia product of step (g), and a portion of the gas stream of oxygen from step (e), together with a nutrient solution and an initial charge of Hansanula polymorpha DL 1 yeast, into a fermenter for the production of single cell protein with the formation of by-product gases containing oxygen and CO_2,

(i) passing the gases containing oxygen and CO_2 from step (h) to said partial oxidation step (a), to act as primary oxygen for the partial oxidation step (a) and as a temperature moderator therefor,

(j) recovering from the fermenter in step (h), single cell protein as a product of the process.

4,242,459

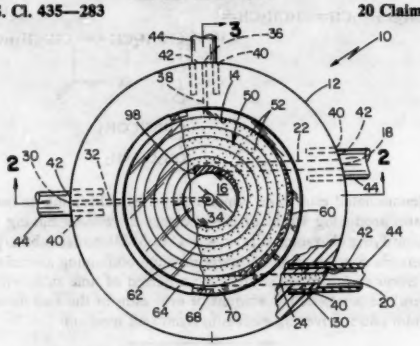
CELL CULTURE DEVICE

William L. Chick, 32 Willow Rd., Wellesley, Mass. 02181; Pierre M. Galletti, 36 Taber Ave.; Peter D. Richardson, 60 Sargent Ave., both of Providence, R.I. 02906, and Georg Panol, 165 Shenandoah Rd., Warwick, R.I. 02886

Filed Nov. 2, 1978, Ser. No. 957,303

Int. Cl.[3] **A01N** *1/02*

U.S. Cl. 435—283 **20 Claims**



1. A cell culture device comprising,

a body having a generally circular fluid tight cavity therein, said body having an inlet and an outlet and

a semi-permeable tube wrapped about itself to form coils in said cavity, said coils forming a flat spiral about a central axis,

the interior of said tube providing a fluid flow path for communicating with a biological fluid source,

said flat spiral coils positioned in said cavity between a bottom wall and a cover plate to form a cell culture compartment therebetween.

said tube being tightly wound in said flat spiral such that adjacent coils thereof touch each other to substantially eliminate dead space between said coils,

the ends of said tube extending through said inlet and said outlet, and

said cavity being shaped to entirely surround said coils and being just wide enough and high enough to accommodate said tightly wound coils, to further reduce dead space.

4,242,460

CELL CULTURE DEVICE

William L. Chick, 32 Willow Rd., Wellesley, Mass. 02181; Pierre M. Galletti, 36 Taber Ave.; Peter D. Richardson, 60 Sargent Ave., both of Providence, R.I. 02906, and Georg Panol, 165 Shenandoah Rd., Warwick, R.I. 02886

Filed Dec. 26, 1978, Ser. No. 972,961

Int. Cl.[3] **C12M** *3/00*

U.S. Cl. 435—284 **18 Claims**

1. A cell culture device comprising,

a housing,

a stationary spool mounted within and wholly surrounded by said housing,

said housing and spool defining a fluid tight cavity therebetween,

said housing having a port communicating with said cavity for introduction of cells into said cavity,

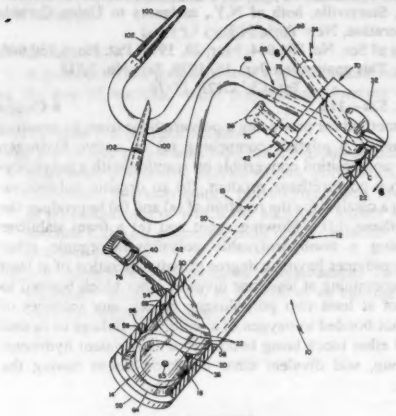
said housing having inlet and outlet means,

a semipermeable tube wrapped about said spool along the longitudinal axis thereof to form coils in said cavity,

the ends of said tube extending through said inlet and outlet means,

the interior of said tube defining a fluid flow path for communicating with a fluid source, and

the walls of said housing, spool, and tube defining an enclosed cell culture compartment,



said tube being of a material capable of permitting transport, from said compartment to fluid flowing along said path, of products produced by said cells, and transport from said fluid to said compartment of nutrients for said cells, while maintaining immunological separation between said fluid and said cells.

4,242,461

RADIAL REACTOR FOR ENZYME-CATALYZED REACTIONS

Francesco Bartoli; Franco Morisi, both of Rome, and Delio Zaccardelli, Monterotondo, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Sep. 12, 1978, Ser. No. 941,682

Claims priority, application Italy, Oct. 13, 1977, 28553 A/77

Int. Cl.³ C12M 1/40

U.S. Cl. 435—288 **9 Claims**

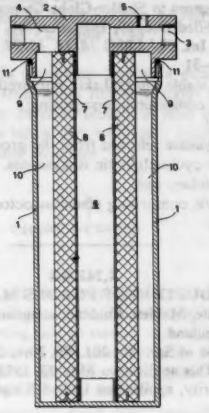
1. A radial reactor for performing enzyme-catalyzed reactions with a solution comprising:

a cylindrically shaped body for receiving the solution to be treated,

a catalytic bed within said body which is cylindrical and coaxial therewith and wherein said bed is composed of fibers having enzymes occluded therein for treating the solution, the fibers being helically coiled about a core at a pitch from 0.001 mm to 10 centimeters for effecting the treatment of the solution as it flows therethrough,

a pair of cylindrical chambers within said body and coaxial therewith, wherein one of said chambers is within said catalytic bed and the other of said chambers is about said catalytic bed, and wherein one of said chambers is adapted to receive and to distribute the solution through said catalytic bed radially of said body and the other of said chambers is adapted to collect the reaction product after the solution has flowed through said catalytic bed radially of said body, and

a cover fastened to said body having an inlet channel open to said distribution chamber for conveying the solution to be treated thereto, a vent open to said inlet channel adapted to discharge the solution within the said inlet channel when said reactor is stopped, and an outlet channel open



to said collection chamber for discharging the reaction product of the treated solution from said reactor.

4,242,462

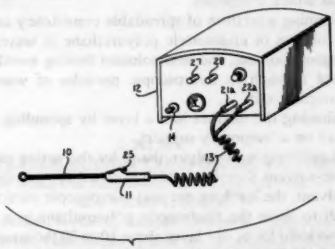
ELECTRICALLY POWERED SELF-HEATING INOCULATING LOOP

Richard E. Thomas, 190 Windsor Ct., Athens, Ga. 30606

Filed Mar. 16, 1979, Ser. No. 20,999

Int. Cl.³ C12M 1/26

U.S. Cl. 435—292 **5 Claims**



1. An electrically powered inoculating loop which is heated to sterilization temperature by passing an electrical current, introduced from a source of electrical power, through the inoculating loop, comprising:

(a) an inoculating loop made of material suitable for heating to sterilization temperature by passing an electrical current through said loop;

(b) a means for introducing an electrical current from said source of electrical power to said inoculating loop; and

(c) a first temperature control circuit breaker means responsive to the temperature of the inoculating loop for discontinuing the electrical current from said source of electrical power to said inoculating loop when the temperature of said inoculating loop reaches sterilization temperature.

4,242,463

COLOR STABLE INTEGRAL SKIN FOAM

John L. Sanok, Wyandotte, and Albert F. Reilly, Howell, both of Mich., assignors to Sheller-Globe Corporation, Toledo, Ohio

Filed Dec. 19, 1979, Ser. No. 105,379
Int. Cl.³ C08G 18/14, 18/24, 18/75
U.S. Cl. 521—51 34 Claims

1. A color stable integral skin polyurethane foam prepared by reacting a composition comprising:

(a) a polyol,

(b) an isocyanate selected from the group consisting of aliphatic or cyclo-aliphatic isocyanates,

(c) a crosslinker, and

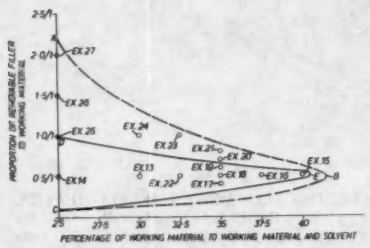
(d) a catalyst comprising stannous octoate and dimethyltin dilaurate.

4,242,464

PRODUCTION OF POROUS MATERIALS

David L. Boutle, Malden, England, assignor to Poryair Limited, Norfolk, England

Continuation of Ser. No. 201,295, Nov. 23, 1971, Pat. No. 4,157,424. This application May 23, 1979, Ser. No. 41,761
Claims priority, application United Kingdom, Aug. 13, 1964, 33047/64
The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.
Int. Cl.³ B29D 27/04
U.S. Cl. 521—61 13 Claims



10. A method of making a microporous polymeric plastics material which comprises

(a) forming a mixture of spreadable consistency comprising a solution of elastomeric polyurethane in water-miscible organic solvent, the said solution having evenly distributed through its microscopic particles of water-soluble inorganic salt,

(b) shaping the mixture into a layer by spreading said mixture on a temporary support,

(c) solidifying said polyurethane by the action of aqueous non-solvent therefor, which is miscible with the organic solvent, the leaching out said microscopic particles of the salt to leave the elastomeric polyurethane in a microporous solid form, as a layer about 10 to 20 thousandths of an inch thick, the weight ratio of salt to polyurethane being up to about 6:1,

said process including the step of stripping the solidified layer from said support.

4,242,465

FIRE RESISTANT FOAM INSULATION

Peter J. Canterino, Towaco, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,901
Int. Cl.³ C08J 9/04
U.S. Cl. 521—88 4 Claims

1. Cross-linked, flame retarded poly(p-methylstyrene) foam insulation, said poly(p-methylstyrene) containing at least 90% para isomer, and containing an effective amount of a flame-retardant material.

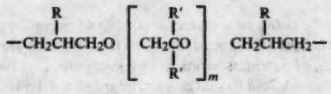
4,242,466

POLYURETHANES AND THEIR PREPARATION

Curtis L. Schilling, Jr., Croton-On-Hudson, and C. Scott Eschbach, Stormville, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 891,044, Mar. 28, 1978, Pat. No. 4,150,048. This application Jan. 16, 1979, Ser. No. 3,818
Int. Cl.³ C12P 13/16
U.S. Cl. 521—112 6 Claims

1. A method for producing a polyurethane foam by reacting and foaming a mixture comprising (a) an active hydrogen organic composition convertible by reaction with a polyisocyanate to a polyurethane product, (b) an organic polyisocyanate, (c) a catalyst for the reaction of (a) and (b) to produce the polyurethane, (d) a blowing agent and (e) a foam stabilizer comprising a nonhydrolyzable polysiloxane-organic ether block copolymer having a degree of polymerization of at least 15 and containing at least one divalent ether block bonded to silicon of at least two polysiloxane blocks, any valences of silicon not bonded to oxygen of a ≡SiOSi≡ linkage or to said divalent ether block being bonded to a monovalent hydrocarbon group, said divalent ether block or blocks having the formula:



wherein R is a monovalent hydrocarbon group, R′ is hydrogen or a monovalent hydrocarbon group, and m is an integer of 0 or greater and wherein R and R′ may be the same or different throughout the same ether block or block copolymer molecule and the —$CH_2CH(R')_2O$—units may be the same or different through the same ether block.

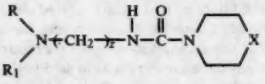
4,242,467

UREA DERIVATIVES AND USE AS POLYURETHANE CATALYSTS

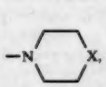
Robert L. Zimmerman, Austin, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jun. 12, 1979, Ser. No. 47,847
Int. Cl.³ C08G 18/20, 18/14; C07D 295/10, 413/12
U.S. Cl. 521—129 9 Claims

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound falling within the following structural formula:



where R and R_1 when taken individually are lower alkyl or when taken together represent



z is an integer of 2–6 and X is O or N—R_2 where R_2 is lower alkyl.

4,242,468

USE OF MONOHYDROXYLATED POLYBUTADIENE AS A REACTIVE PLASTICIZER IN POLYURETHANES

Michael Baack; Artur Bartkowiak, and Juergen Neuroth, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Revertex Limited, United Kingdom

Filed Aug. 23, 1979, Ser. No. 69,237

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2836986

Int. Cl.[3] C08G *18/62*

U.S. Cl. 521—170 8 Claims

1. A process for the preparation of a polyurethane, comprising the step of reacting, under polyurethane-forming conditions,

(A) at least one polyisocyanate,

(B) at least one polyol selected from the group consisting of polyesters, polyethers, polythioethers, polyacetals, polycarbonates, polyesteramides, polyalkylene diols, and diols of polyalkadienes of which the alkadiene moiety has the formula C_nH_{2n-4} wherein n is an integer selected from 3 and above 4, and

(C) a monohydroxy-terminated polybutadiene having a molecular weight of 500 to 100,000 as an internal plasticiser for the polyurethane.

4,242,469

CONTROLLING GRAFTED ELASTOMERS IN BLENDS WITH RESINOUS COPOLYMERS

Joseph M. Schmitt, Ridgefield, and Richard J. Quinn, Bethel, both of Conn., assignors to CY/RO Industries, Stamford, Conn.

Filed Sep. 18, 1978, Ser. No. 943,606

Int. Cl.[3] C08L *51/04, 53/02*

U.S. Cl. 525—71 22 Claims

1. A molding composition characterized by exhibiting superior optical properties, low taste-transfer and low odor comprising:

(a) a major proportion of a resinous polymeric phase; and

(b) a minor proportion of a grafted rubbery phase, said rubbery phase being prepared from a rubber and one or more monomers which are grafted thereon and are compatible with said resinous phase, said grafting being performed in a plurality of different rubber-to-monomer ratio rubbery phases within said rubbery phase, the overall ratio of rubber to monomer in said rubbery phase being from about 1:1 to 6:1, and wherein each later grafting stage is performed in the presence of the products of the previous grafting stages by adding thereto additional rubber and one or more monomers.

4,242,470

POLYAMIDE/BLOCK COPOLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 19, 1979, Ser. No. 21,518

Int. Cl.[3] C08L *53/02*

U.S. Cl. 525—92 19 Claims

1. A composition consisting essentially of the admixture obtained by intimately mixing 100 parts by weight of a polyamide with between about 1 and about 40 parts by weight of a block copolymer wherein said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B and wherein said polyamide is selected from the group consisting of nylon 6 and nylon 6/6.

4,242,471

SELECTIVELY CYCLIZED BLOCK COPOLYMERS

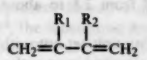
Joginder Lal, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 27, 1979, Ser. No. 69,963

Int. Cl.[3] C08F *8/48*

U.S. Cl. 525—333 16 Claims

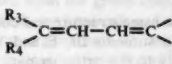
1. A cyclized block copolymer having a number average molecular weight of from about 10,000 to about 300,000 comprised of at least two different blocks, at least one of which blocks is a cyclizable block derived from a conjugated diene monomer of the general structure



wherein,

R_1 is selected from a hydrocarbyl group containing one to twelve carbon atoms, R_2 is selected from hydrogen or a hydrocarbyl group containing one to twelve carbon atoms; and at least one of which blocks is a non-cyclizable block derived from at least one member selected from the following classes of compounds:

(a) polymers of conjugated diene monomers of the general structure



wherein:

R_3, R_4 and R_5 are the same or different and are selected from hydrogen or a hydrocarbyl group containing one to twelve carbon atoms; R_6 is selected from hydrogen, a hydrocarbyl group containing one to twelve carbon atoms or a cyano group,

(b) polymers of α-methylstyrene, styrene, alkyl or aryl substituted styrenes or halogen substituted styrenes,

(c) polymethacrylonitrile, polycaprolactam, polycaprolactone or polydimethylsiloxane,

said cyclized blocks constituting about 5–95 weight percent of cyclized block copolymer and said non-cyclized blocks constituting about 95–5 weight percent of cyclized block copolymer.

4,242,472

VULCANIZABLE RUBBER COMPOSITION IMPROVED IN SULFUR BLOOMING WITH METAL ALKYLXANTHATE

Takashi Hoshino, Kodaira; Setsuko Imaizumi, Tokyo, and Seisuke Tomita, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Feb. 8, 1979, Ser. No. 10,349

Claims priority, application Japan, Feb. 17, 1978, 53-16430

Int. Cl.[3] C08F *8/34;* C08C *19/00*

U.S. Cl. 525—343 6 Claims

1. A vulcanizable rubber composition improved in sulfur blooming characterized by adding from 0.1 to 10% by weight, based on the weight of sulfur contained in said composition, of alkylxanthate to a rubber composition obtained by compounding sulfur as a vulcanizing agent in the amount of 0.5 to 10 parts by weight in relation to 100 parts by weight of rubber which may be any of natural rubber, synthetic rubber and the mixtures thereof, so as to coagulatingly keep a supersaturated sulfur within said vulcanizable rubber composition.

4,242,473

FLAME RETARDED POLY(BUTYLENE TEREPHTHALATE) COMPOSITION

Richard C. Nametz, Manchester, and Robert J. Nulph, Ypsilanti, both of Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

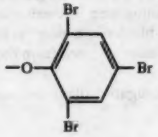
Continuation-in-part of Ser. No. 877,157, Feb. 13, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 74,363

Int. Cl.³ C08G 65/48

U.S. Cl. 525—397 5 Claims

1. A flame retarded poly(butylene terphthalate) composition comprised of poly(butylene terphthalate) and from about 5 to about 35 percent by weight of a branched polymer having a hydroxyl number of from 2.8 to about 30 of the structural formula t,0260

wherein each repeating unit set out within the brackets of the structural formula is attached in an ortho or para configuration to its adjacent phenyl and phenoxy moiety; and wherein E is an end group of the formula



Y is a side chain of the same structure and configuration as said repeating unit; the substituents Br, E and Y on each phenyl ring are attached only to the ortho or para positions relative the hydroxyl group in the structural formula and the oxygen atom in the repeating unit; each t, p and q are independently the integer 0 or 1, provided that the sum of t plus p plus q equals 2, and provided that from about 10 to about 80 percent of the repeating units have the side chain and end unit —Y—E attached thereto; and m is an integer such that the total molecular weight of the polymer ranges from 2000 to 20,000.

4,242,474

PRODUCTION OF A BLOCK COPOLYMER CONTAINING HYDROPHILIC AND HYDROPHOBIC BLOCKS

Isao Shinohara; Teruo Okano, and Masahisa Ikemi, all of Tokyo, Japan, assignors to Terumo Corporation, Tokyo, Japan

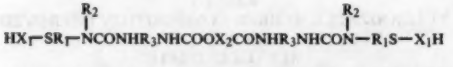
Filed Sep. 24, 1979, Ser. No. 78,209

Claims priority, application Japan, Oct. 4, 1978, 53-122308

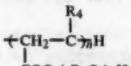
Int. Cl.³ C08L 75/08, 71/07; C08F 783/06

U.S. Cl. 525—404 30 Claims

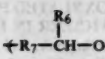
1. A block copolymer having hydrophilic and hydrophobic blocks expressed by the general formula:



where R_1 is a divalent hydrocarbon group; R_2 is hydrogen atom or methyl group; R_3 is a divalent hydrocarbon-based group; X_1 is a polymeric acrylic acid derivative represented by the formula:



R_4 is hydrogen atom or an alkyl group having 1 to 4 carbon atoms; m is an integer of 1 to 10; R_5 is an alkylene group having 2 to 10 carbon atoms when m is 1 or an alkylene group having 2 or 3 carbon atoms when m is 2 to 10; n is an integer of 10 to 500; X_2 is a polyalkylene oxide represented by the formula:



R_6 is hydrogen atom or an alkyl group having 1 to 4 carbon atoms; R_7 is an alkylene group having 1 to 3 carbon atoms; and l is an integer of 10 to 1,100.

4,242,475

PROCESS FOR PRODUCING NOVEL CURABLE RESIN CAPABLE OF BEING CURED BY THE EXPOSURE TO HEAT OR RADIATION AND CURABLE COATING COMPOSITION CONTAINING SAID CURABLE RESIN

Shozo Tsuchiya, Tokyo, and Hideo Hayashi, Yokohama, both of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Jan. 15, 1979, Ser. No. 3,150

Claims priority, application Japan, Jan. 23, 1978, 53-5277

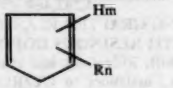
Int. Cl.³ C08F 283/00; C08G 63/38

U.S. Cl. 525—534 19 Claims

1. A process for producing a curable resin which comprises the steps of:

(i) polymerizing a five-member cyclic compound (A) having an unsaturated conjugated double bond and represented by the general formula (A) given below;

GENERAL FORMULA (A):



wherein R is an organic residue having from 1 to 3 carbon atoms; m and n are integers and are in the relation of $m+n=6$

or Diels-Alder addition product thereof (A) with at least one phenolic compound (B) selected from the group consisting of monohydric and polyhydric phenols and alkyl substituents thereof to obtain a resin (I) having at least one phenolic hydroxyl group and an average molecular weight of from 300 to 2000;

(ii) hydrogenating said resin (I) to convert the aromatic ring of the phenolic compound unit into the cyclohexane structure thereby to obtain a resin (II); and

(iii) esterifying said resin (II) with an α,β-unsaturated carboxylic acid (C).

4,242,476

POLYMER/POLYOL COMPOSITIONS CONTAINING VINYLIDENE CHLORIDE

Naresh R. Shah, Nitro; Edgar G. Shook, South Charleston, and Russell Van Cleve, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 17, 1978, Ser. No. 961,715

Int. Cl.³ C08F 2/06

U.S. Cl. 526—71 10 Claims

1. A continuous process for producing a polymer/polyol composition which comprises continuously polymerizing a reaction mixture formed by mixing a stream containing a polyol having a molecular weight of at least 1000 and a free radical catalyst, said stream being maintained at a temperature of 100° C. or higher, and a minor amount of a monomer stream consisting essentially of (a) from 45 to 5 weight percent of vinylidene chloride and (b) from 55 to 95 weight percent another ethylenically unsaturated monomer or monomers selected from the group consisting of acrylonitrile, methacrylonitrile, methyl methacrylate, styrene, and α-methylstyrene, of which at least 20 weight percent is acrylonitrile, and continuously stripping the desired product to remove unreacted monomers.

4,242,477
ASCORBATE SHORT-STOPS

Ahti A. Koski, Brigden, and Melvin J. G. Davidson, Sarnia, both of Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Dec. 5, 1979, Ser. No. 100,298
Claims priority, application Canada, Aug. 1, 1979, 332982
Int. Cl.³ C08F 2/42
U.S. Cl. 526—84 7 Claims

1. An improved process for short-stopping the polymerization of butadiene and styrene in an emulsion, free-radical polymerization process conducted at from about 40° to about 60° C. using potassium or ammonium persulphate as polymerization initiator, characterized in that the short-stop is ascorbic acid or the sodium or potassium salts thereof, the quantity of ascorbic acid or salt thereof added as short-stop being from about 0.1 to about 0.75 parts by weight per 100 parts by weight of butadiene plus styrene charged to the polymerization system.

4,242,478
LOW BENZENE BUTADIENE POLYMERIZATION

Evalds Lasis, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Apr. 12, 1979, Ser. No. 29,545
Claims priority, application Canada, May 8, 1978, 302852
Int. Cl.³ C08F 4/60, 2/06
U.S. Cl. 526—93 4 Claims

1. A process for the polymerization of butadiene-1,3 to produce a cis-1,4-polybutadiene having a cis-1,4 content of at least about 90% using a catalyst system comprising a cobalt salt of an organic carboxylic acid, an aluminum alkyl halide and water, characterized in that the polymerization is in the presence of (a) a diluent which comprises per 100 parts by weight, (i) from 100 to about 80 parts by weight of cyclohexane and from 0 to about 20 parts by weight of benzene or butene-1, or (ii) from about 92.5 to about 60 parts by weight of cyclohexane, from about 2.5 to about 15 parts by weight of benzene and from about 5 to about 25 parts by weight of butene-1, and (b) a modifier selected from about 0.05 to about 0.15 parts by weight of butadiene-1,2 per 100 parts by weight of butadiene-1,3 or from about 0.2 to about 1 parts by weight of 1,5-cyclooctadiene per 100 parts by weight of butadiene-1,3, the cobalt salt is one of cobalt (II) octanoate or cobalt (II) naphthenate and the aluminum alkyl halide is diethyl aluminum chloride, the molar ratio of the cobalt salt to the aluminum alkyl halide is from 1:5 to 1:500, the amount of cobalt salt is from about 0.01 to about 0.5 millimoles per 100 g of butadiene-1,3 and the amount of water is from about 0.2 to about 0.9 millimoles per millimole of aluminum alkyl halide.

4,242,479
PROCESS FOR PRODUCING AN IMPROVED ETHYLENIC POLYMER

Yoshihisa Yokota; Teruo Hosokawa, both of Yokohama, and Kiichiro Sakashita, Kawasaki, all of Japan, assignors to Showa Yuka Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,560
Claims priority, application Japan, Dec. 23, 1976, 51/154218; Nov. 28, 1977, 52/141487; Dec. 13, 1977, 52/148780
Int. Cl.³ C08F 4/02, 10/02
U.S. Cl. 526—124 68 Claims

1. A process for polymerizing ethylene or copolymerizing ethylene with an δ-olefin in the presence of a catalyst comprising:

(A) a solid catalyst ingredient obtained by contacting

(1) a solid reaction product prepared by reacting:

(a) a reaction product of (i) an aluminum trihalide and (ii) at least one organic compound represented by general formulae (I), (II), (III) or (IV)

$$Si(OR^1)_aR^2_b \quad (I)$$

$$R^3(R^4_2SiO)_dSiR^5_3 \quad (II)$$

$$(R^6_2SiO)_e \quad (III)$$

$$R^7—O—R^8 \quad (IV)$$

wherein R^1, R^2, and R^6 are the same or different and represent a hydrocarbon radical having at most 20 carbon atoms selected from the group consisting of alkyl radicals, alkenyl radicals, cycloalkyl radicals, cycloalkenyl radicals, aryl radicals and aralkyl radicals and derivatives of these hydrocarbon radicals substituted with at most 3 halogen atoms or alkoxy radicals having at most 20 carbon atoms, wherein R^2 further represents a hydrogen atom or a halogen atom, R^3, R^4 and R^5 are the same or different and represent the above-defined hydrocarbon radicals for R^1, R^2 or R^6, the substituted derivatives for R^1, R^2, or R^6, or a halogen atom, R^7 and R^8 are the same or different and represent a hydrocarbon radical having at most 10 carbon atoms selected from the group consisting of alkyl radicals, aryl radicals and aralkyl radicals, a+b is 4 with the proviso that a is not 0, d is an integer of from 1 to 1000 and e is an integer of from 2 to 1000; and

(b) a magnesium alcoholate represented by general formula (V)

$$Mg(OR^9)_2 \quad (V)$$

wherein R^9 represents a hydrocarbon radical having at most 8 carbon atoms selected from the group consisting of alkyl radicals, cycloalkyl radicals, aryl radicals and aralkyl radicals, and washing with an inert organic solvent; with

(2) a tetravalent titanium compound containing at least one halogen atom, represented by general formula (VI)

$$TiX^1_f(OR^{10})_g \quad (VI)$$

wherein X^1 represents a chlorine, bromine or iodine atom, R^{10} represents a hydrocarbon radical having at most 12 carbon atoms selected from the group consisting of alkyl radicals, alkenyl radicals, cycloalkyl radicals, aryl radicals and aralkyl radicals, f+g is 4 where g is 0 or 1; and

(B) an organoaluminum compound; where the amount of said aluminum trihalide (i) is from 0.25 to 4 moles per mole of said organic compound (ii), the amounts of said aluminum trihalide (i) and said organic compound (ii) are from 0.1 to 10 moles per mole of said magnesium alcoholate, respectively, and the amount of said tetravalent titanium compound (2) is from 0.1 to 200 moles per magnesium atom in said solid reaction product (1).

4,242,480
CATALYST AND PROCESS OF POLYMERIZATION OF ALPHA MONOOLEFINS

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1977, Ser. No. 860,263
Int. Cl.³ C08F 4/02, 10/06
U.S. Cl. 526—125 38 Claims

1. A process for the polymerization of at least one alpha-monoolefin monomer which comprises polymerizing said at least one alpha-monoolefin monomer under polymerization conditions employing a catalyst system which comprises (A) a milled admixture of effective ratios of a tetravalent titanium halide, magnesium or manganous chloride, a first Lewis base, and a non-aromatic unsaturated hydrocarbon aliphatic or alicyclic compound, (B) a trihydrocarbyl aluminum compound, optionally with a second Lewis base, and optionally including (C) a dihydrocarbyl aluminum halide, employing catalytically effective ratios of B:A, and of C, where employed, wherein said titanium halide is represented by $TiX_{4-n}R'_n$ wherein X is a halogen and is bromine, chlorine, or iodine, R' is an alkyl, cycloalkyl, aryl, aryloxy, alkoxy, or combination radical of 2 to 8 carbon atoms, and n is zero or an integer of 1, 2, or 3.

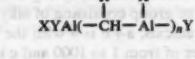
4,242,481

ALUMINUM OLIGOMERS AS POLYMERIZATION CATALYSTS

Loyd W. Fannin, Dickinson, Tex., assignor to Texas Alkyls, Inc., Deer Park, Tex.

Division of Ser. No. 774,005, Mar. 3, 1977, Pat. No. 4,170,603.
This application May 7, 1979, Ser. No. 36,278
Int. Cl.[3] C08F 4/14
U.S. Cl. 526—165 1 Claim

1. In a process for polymerization of a mono- or di-olefin in the presence of a multi-component Ziegler type catalyst having an organoaluminum compound as one component, the improvement comprising utilizing as the organoaluminum compound, a compound having the formula



in which X is a halogen, Y is an alkyl group having from 1 to 10 carbon atoms, or a phenyl group, R is an alkyl group having from 2 to 9 carbon atoms, and n is an integer from 1 to 20, provided that when Y is methyl, R is a straight chain alkyl group having from 2 to 9 carbon atoms in the primary chain.

4,242,482

PEROXYGEN COMPOUND-METAL MERCAPTIDE REDOX CATALYST SYSTEM FOR VINYL HALIDE POLYMERIZATION

Norman G. Gaylord, New Providence; Meshulam Nagler, Irvington, and Marvin M. Fein, Westfield, all of N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 21, 1979, Ser. No. 106,331
Int. Cl.[3] C08F 4/40, 4/32, 4/34, 4/58
U.S. Cl. 526—192 15 Claims

1. A process for the preparation of polymers and copolymers of a vinyl halide, which consists in polymerization in bulk or suspension, in the presence of a redox catalyst system consisting of a peroxygen compound selected from the class consisting of peroxyesters and diacyl peroxides, and a reducing agent selected from the class consisting of stannous and antimony (III) mercaptides.

4,242,483

OXYGEN PERMEABLE HARD AND SEMI-HARD CONTACT LENS COMPOSITIONS, METHODS AND ARTICLES OF MANUFACTURE

Nick N. Novicky, 250 Old Oak Dr., Buffalo Grove, Ill. 60090

Filed Aug. 13, 1979, Ser. No. 66,054
Int. Cl.[3] C08F 220/28
U.S. Cl. 526—263 7 Claims

1. An oxygen permeable, hard or semi-hard, machinable, dimensionally stable, wettable, contact lens material of high transparency consisting essentially of a polymer formed by free radical polymerization from about 10% to about 60% by weight of at least one silicon-containing monomer selected from the class consisting of bis(pentamethyldisiloxanyl) bis(-trimethylsiloxy)methylsiloxanylmethacryloxypropylsilane, bis[bis(trimethylsiloxy)methylsiloxanyl]pentamethyldisiloxanylmethacryloxy-propylsilane, and tris[bis(trimethylsiloxy)-methylsiloxanyl]methacryloxypropylsilane and mixtures thereof, and from about 40% to about 90% by weight of at least one monomer selected from the class consisting of polymerizable esters of acrylic or methacrylic acids and mixtures thereof, and from polymerizable itaconate esters and mixtures thereof.

4,242,484

VINYLIDENE CHLORIDE COPOLYMER AS A MATERIAL FOR PRODUCTION OF PACKAGING ARTICLES

Akira Suzuki, Shibukawa; Akira Ishida, Harahigashi, and Masao Oya, Tokyo, all of Japan, assignors to Nippon Zeon Co., Ltd. and Kanto Denka Kogyo Co., Ltd., both of Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 27,057
Claims priority, application Japan, Apr. 8, 1978, 53-41476
Int. Cl.[3] C08F 214/06, 214/08
U.S. Cl. 526—273 1 Claim

1. A molding composition for the production of packaging articles, which is usable in a direct blow molding process, said composition containing a vinylidene chloride copolymer prepared by suspension polymerization and comprising as constituent monomeric units

(1) 70 to 90% by weight of vinylidene chloride,
(2) 0.5 to 10% by weight of glycidyl methacrylate,
(3) 0.05 to 3% by weight of methyl methacrylate, and the balance
(4) 5 to 25% by weight of vinyl chloride.

4,242,485

UV LIGHT RESISTANT P-METHYLSTYRENE/METHYL METHACRYLATE COPOLYMER

Aristotle G. Prapas, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 77,976
Int. Cl.[3] C08F 212/12, 220/14
U.S. Cl. 526—329.2 3 Claims

1. UV light resistant solid, linear copolymers of p-methylstyrene or a methylstyrene mixture containing at least about 95 weight percent p-methylstyrene and less than 0.1 weight percent o-methylstyrene with the balance being m-methylstyrene and methyl methacrylate containing between about 20 weight percent and about 50 weight percent methyl methacrylate.

4,242,486

PROCESS FOR PREPARING ORGANOPOLYSILOXANE RESINS CONTAINING SI-BONDED VINYL GROUPS

Peter August, Seevetal, and Willi Primas, Simbach, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 39,014
Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2823118
Int. Cl.[3] C08G 77/06
U.S. Cl. 528—14 4 Claims

1. A process for preparing organopolysiloxane resins containing Si-bonded vinyl groups which comprises heating to a temperature of from about 85° to 95° C., a mixture containing (A) an organopolysiloxane having at least 0.1 percent by weight of Si-bonded hydroxyl groups and containing units selected from the group consisting of R $SiO_{3/2}$, R_2SiO, $R_3SiO_{1/2}$, $SiO_{4/2}$ and $O_{3/2}$ Si CH_2CH_2 $SiO_{3/2}$ units, in which at least 50 mol percent of the units of the organopolysiloxane are monoorganosiloxane units of the formula $RSiO_{3/2}$, in which R represents SiC-bonded hydrocarbon radicals, (B) an organosiloxane having from 2 to 10 silicon atoms per molecule, in which substantially all the silicon valences which are not satisfied by silicon oxygen atoms, are satisfied by SiC-bonded hydrocarbon radicals, and at least two such hydrocarbon radicals are present for each silicon atom with at least one of the siloxanes (A) and (B) having an average of at least one Si-bonded vinyl group and (C) an acid activated bleaching clay, wherein water released during the heating step by the condensation of Si-bonded hydroxyl groups is retained in the reactive mixture, and thereafter separating the organopolysiloxane resins from the bleaching clay.

4,242,487
PROCESS FOR PRODUCING HEAT-RESISTANT SEMI-INORGANIC COMPOUNDS

Seishi Yajima; Kiyohito Okamura; Toetsu Shishido, and Yoshio Hasegawa, all of Oharai, Japan, assignors to The Foundation: The Research Institute for Special Inorganic Materials, Asahi, Japan

Filed May 1, 1979, Ser. No. 34,885
Claims priority, application Japan, May 9, 1978, 53-54036
Int. Cl.[2] C08G *77/04*
U.S. Cl. 528—25 **3 Claims**

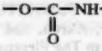
1. A process for producing a heat-resistant semi-inorganic compound, which comprises reacting an organoborosiloxane compound with at least one organic compound selected from the group consisting of an aliphatic polyhydric alcohol, an aromatic alcohol, a phenol and an aromatic carboxylic acid at a temperature of 250° to 450° C. in an atmosphere inert to the reaction.

4,242,488
MODIFIED POLYURETHANE ADHESIVE COMPOSITIONS CONTAINING A CARBAMATE ESTER ADDITIVE USEFUL IN LAMINATING SUBSTRATES

Henry Stanley, Cedar Grove, and Dilip K. Ray-Chaudhuri, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 9, 1979, Ser. No. 37,476
Int. Cl.[3] C08L *75/04*
U.S. Cl. 428—423.1 **10 Claims**

1. A modified polyurethane adhesive composition comprising an isocyanate-terminated prepolymer or a fully reacted polyurethane and at least an effective amount of a monomeric carbamate ester which contains at least one linkage of the formula



and which is compatible and not reactive with said prepolymer or fully reacted polyurethane.

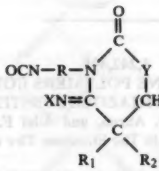
4,242,489
PROCESS FOR PREPARING POLYURETHANES

Kurt Findeisen; Kuno Wagner, and Walter Uerdingen, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 656,909, Feb. 10, 1976, Pat. No. 4,173,567. This application Jun. 11, 1979, Ser. No. 47,517
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507682
Int. Cl.[3] C08G *18/77, 18/14, 18/78*
U.S. Cl. 528—73 **4 Claims**

1. A process for the production of polyurethanes or of polyurethane lacquers comprising

reacting a compound containing at least two isocyanate-reactive hydrogen atoms with an organic diisocyanate of the formula



(I)

in which

R represents a substituted or unsubstituted aliphatic hydrocarbon group having 2 to 12 carbon atoms, a substituted or unsubstituted cycloaliphatic hydrocarbon group having 4 to 15 carbon atoms, a substituted or unsubstituted aromatic hydrocarbon group having 6 to 15 carbon atoms or a substituted or unsubstituted araliphatic hydrocarbon group having 7 to 15 carbon atoms, said hydrocarbon group having at most three substituents selected from the group consisting of halogen, C_1–C_4—alkyl, methoxy, nitro and C_1–C_4-carbalkoxy groups, represents —O— or —N(R_3)—, where R_3 represents hydrogen, an aliphatic hydrocarbon group having 1 to 4 carbon atoms, a cycloaliphatic hydrocarbon group having 5 to 6 carbon atoms, a phenyl group or —CO—NH—R—NCO,

n=0 or 1,

R_1 and R_2 are the same or different and represent hydrogen, a substituted or unsubstituted aliphatic hydrocarbon group having 1 to 17 carbon atoms, a substituted or unsubstituted cycloaliphatic hydrocarbon group having 4 to 15 carbon atoms, a substituted or unsubstituted aromatic hydrocarbon group having 6 to 15 carbon atoms or a substituted or unsubstituted araliphatic hydrocarbon group having 7 to 15 carbon atoms, said hydrocarbon group having at most three substituents selected from the group consisting of halogen, C_1–C_4-alkyl, methoxy, nitro and C_1–C_4-carbalkoxy groups or R_1 or R_2 together with the ring carbon atom form a cycloaliphatic ring having 4 to 15 carbon atoms, and represents —CO—NH—R—NCO.

4,242,490
THERMOSET POLYURETHANE PREPARED FROM A POLYPROPYLENE ETHER TRIOL OBTAINED USING A DOUBLE METAL CYANIDE COMPLEX CATALYST, ETHYLENE GLYCOL AND TOLYLENE DIISOCYANATE

Roy J. Emerson, Tallmadge; Hubert J. Fabris; Robert J. Herold, both of Akron, all of Ohio, and Joe S. Duncan, Leesburg, Fla., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Jul. 20, 1979, Ser. No. 59,342
Int. Cl.[3] C08G *18/48*
U.S. Cl. 528—77 **5 Claims**

1. A thermoset, segmented and elastomeric polypropylene ether urethane consisting essentially of the reaction product of tolylene diisocyanate, ethylene glycol and a polypropylene ether triol having an average molecular weight of from 7,000 to 14,000, the weight ratio of tolylene diisocyanate plus ethylene glycol to the polypropylene ether triol being from about 0.4:1 to 1.0 to 1, the equivalent ratio of the tolylene diisocyanate to the ethylene glycol plus the polypropylene ether triol being from about 1:0.90 to 1:1.05, the temperature retraction TR-10 of the polypropylene ether urethane being less than about −35° C. and the Goodyear-Healy rebound of the polypropylene ether urethane being greater than about 55%, the polypropylene ether triol having been made by the reaction of propylene oxide with a low molecular weight triol using a polymerization catalyst of the double metal cyanide complex class.

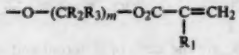
4,242,491
POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUENTS OF ACRYLATE FUNCTIONALITY

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,102
Int. Cl.[3] C08G *83/00*
U.S. Cl. 528—168 **16 Claims**

1. A polyphosphazene polymer comprised of units represented by the formulas:

wherein X is



in which R_1 is selected from a group consisting of hydrogen and —CH_3; and R_2 and R_3 are independently selected for each carbon atom from a group consisting of hydrogen and alkyl radicals containing from 1 to 6 carbon atoms; and wherein X is independently selected for each polymer unit, X′ is the same as X or is selected from a group consisting of substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radicals, or mixtures thereof; $2 \leqq m \leqq 20$, and $w+y+z \geqq 20$.

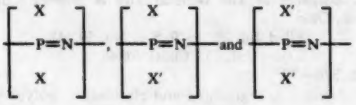
4,242,492

POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUTED OR UNSUBSTITUTED NITROPHENOXY SUBSTITUENTS

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1978, Ser. No. 941,119
Int. Cl.³ C08G *83/00*
U.S. Cl. 528—168 **8 Claims**

1. A method of preparing polyphosphazene polymers consisting of units represented by the formulas:



wherein X is selected from the group consisting of substituted and unsubstituted mono, di, and tri nitro phenoxy groups or mixtures thereof and wherein X′ is the same as X or is selected from the group consisting of substituted and unsubstituted alkoxy, alkenyloxy, aryloxy, alkenylaryloxy, amino and mercapto groups; said method comprising reacting a poly(dichlorophosphazene) polymer having the formula —$(NPCl_2)_n$—, wherein n is from 20 to 50,000, with a substituted or unsubstituted mono, di, or tri nitrophenol or a mixture consisting of a substituted or unsubstituted mono, di or tri nitrophenol and a substituted aliphatic or aromatic alcohol, an amino compound or a mercaptan compound in the presence of a tertiary amine.

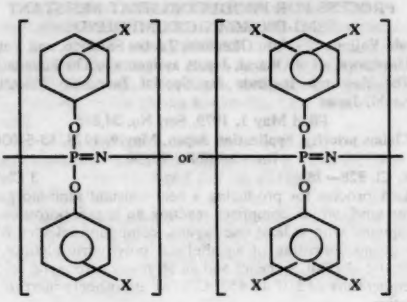
4,242,493

METHOD OF PREPARING SUBSTANTIALLY PURE POLYHALOPHENOXYPHOSPHAZENE HOMOPOLYMERS AND COPOLYMERS

Tai C. Cheng, Akron, and John R. Schreffler, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 19, 1979, Ser. No. 31,579
Int. Cl.³ C08G *79/02, 79/04, 79/14*
U.S. Cl. 528—168 **12 Claims**

1. A method of preparing a substantially pure polyhalophenoxyphosphazene homopolymer which is free of phenoxy groups and which contains from 20 to 50,000 units represented by either of the formulas:



wherein X is fluorine, chlorine, bromine or iodine; said method comprising the steps of:

(a) preparing a substantially pure sodium salt of a halogen-substituted phenol by reacting said halogen-substituted phenol with sodium hydride;

(b) reacting said sodium salt with a poly(dichlorophosphazene) of the formula $(NPCl_2)_n$, wherein n is from 20 to 50,000 to form a mixture of said polyhalophenoxyphosphazene homopolymer and sodium chloride; and

(c) separating the sodium chloride from said mixture thereby producing a substantially pure polyhalophenoxyphosphazene homopolymer.

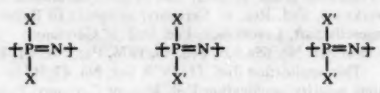
4,242,494

POLYPHOSPHAZENE POLYMERS CONTAINING ALKENYL SUBSTITUENTS

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 20, 1979, Ser. No. 68,036
Int. Cl.³ C08G *83/00*
U.S. Cl. 528—168 **14 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is —CH=CCl—R in which R is independetly selected for each unit from the group consisting of hydrogen and substituted and unsubstituted alkyl, aryl and heterocyclic radicals and wherein X′ is the same as X or is selected from the group consisting of chloro radicals and substituted and unsubstituted alkoxy, aryloxy, amino, mercapto radicals and mixtures thereof, said polymer containing 20 to 30,000 of said units.

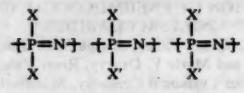
4,242,495

POLYPHOSPHAZENE POLYMERS CONTAINING OXAZOLE AND THIAZOLE SUBSTITUENTS

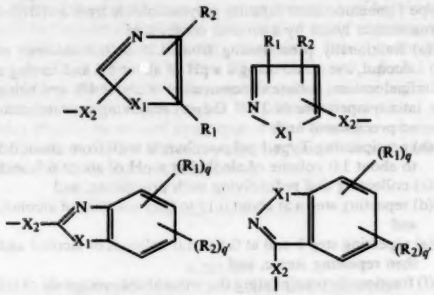
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 4, 1979, Ser. No. 71,650
Int. Cl.³ C08G *83/00*
U.S. Cl. 528—168 **20 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is the same or a mixture of different radicals represented by:



wherein X_1 is selected from the group consisting of —O— and —S—; X_2 is selected from the group consisting of —O—, —S—, —NH—, and —N(R)— where R is a lower alkyl radical; R_1 and R_2 are independently selected from a group consisting of hydrogen, chloro, bromo, cyano, nitro, alkylmercapto, dialkylamino, and substituted and unsubstituted alkyl, aryl, alkoxy and aryloxy radicals; the sum of (q+q') is an integer from 0 to 4; X' can be the same as X or can be selected from a group consisting of halogen and substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radicals and mixtures thereof.

4,242,496

LIQUID CRYSTAL COPOLYESTERS CONTAINING PHENYLHYDROQUINONE

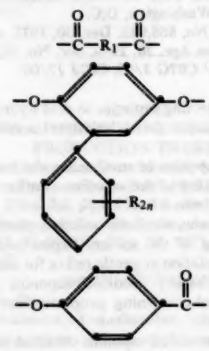
Winston J. Jackson, Jr., Kingsport; Gary G. Gebeau, Johnson City, and Herbert F. Kuhfuss, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 903,369, May 5, 1978, abandoned. This application Dec. 21, 1978, Ser. No. 971,987

Int. Cl.³ C08G *63/60*

U.S. Cl. 528—190 **5 Claims**

1. A copolyester having a fiber-forming molecular weight consisting essentially of the following divalent radicals:

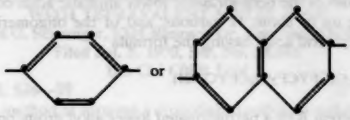


(A)

(B)

(C)

wherein R_1 is



or mixtures thereof, R_2 is hydrogen, chlorine, bromine or a monovalent alkyl radical having one to four carbon atoms, n is 1, 2 or 3, and the range of

is from 25 to 80 mole percent, based on the total moles of radical (A) and radical (C) combined.

4,242,497

PRODUCTION OF AMINO-SILICATE COMPOUNDS, CONDENSATION RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 955,327, Oct. 27, 1978, Pat. No. 4,185,147, Continuation-in-part of Ser. No. 786,617, Apr. 4, 1977, Pat. No. 4,169,930, which is a division of Ser. No. 652,338, Jan. 26, 1976, Pat. No. 4,033,935, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Jan. 10, 1980, Ser. No. 110,925

Int. Cl.³ C08G *2/00*; C08J *9/14*

U.S. Cl. 528—232 **22 Claims**

1. An amino silicate compound obtained by reacting a mixture of components:

A. 0.5 to 2 mols of an oxidated silicon compound selected from the group consisting of hydrated silica, alkali metal silicates, natural silicates containing free silicic acid groups and

B. 1 mol of an amino compound selected from the group consisting of urea, melamine, thiourea, dicyandiamide, alkyl-substituted ureas, alkyl-substituted thioureas, aniline and mixtures thereof.

4,242,498

PROCESS FOR THE PREPARATION OF FLUORINE CONTAINING CROSSLINKED ELASTOMERIC POLYTRIAZINE AND PRODUCT SO PRODUCED

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Robert W. Rosser, San Jose, Calif., and Roger A. Korus, Moscow, Id.

Filed Apr. 9, 1979, Ser. No. 28,300

Int. Cl.³ C08G *63/44*

U.S. Cl. 528—362 **8 Claims**

1. A process for preparing a crosslinked elastomeric polytriazine, which comprises:

(a) forming a polyimidoylamidine by the reaction of anhydrous ammonia under reflux conditions with a dinitrile compound selected from the group consisting of perfluoroalkyl dinitriles having the formula $NC—(CF_2)_p—CN$, wherein p ranges from 2 to 18, and the dinitriles of oligomeric and polymeric compounds having the formula

$$NC—CFY(OCF_2CFY)_mO(CF_2)_pO(CFYCF_2O)_n-CFY—CN$$

wherein Y is fluorine or trifluoromethyl, p ranges from 1 to 18 and m+n ranges from 2 to 7;

(b) forming a linear polytriazine by treating the polyimidoylamidine with a ring-closing reagent selected

from the group consisting of the acyl halides and anhydrides of the perfluorinated lower aliphatic acids containing up to about 12 carbons, and of the oligomeric and polymeric acids having the formula

$$R_fO(CFYCF_2O)_yCFYCOOH$$

wherein R_f is a perfluorinated lower alkyl group containing up to about 3 carbons, Y is fluorine or a trifluoromethyl group, and y is an integer within the range of 0 to about 50;

(c) extending the linear polytriazine chain by treatment with anhydrous ammonia under reflux conditions to form additional imidoylamidine linkages; and

(d) heating the extended polymer at a temperature within the range of about 100° to 200° C. for a period of up to 4 days to cyclize the imidoylamidine linkage and crosslink the polymeric chain.

4,242,499

COLORED POLYMERS COMPRISING POLY(ORGANOPHOSPHAZENES) WITH CHROMOPHORES AS SUBSTITUENT GROUPS

Harry R. Allcock, State College, Pa.; Karen M. Kosydar, Stanford, Calif., and Sarah D. Wright, Hershey, Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

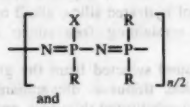
Continuation-in-part of Ser. No. 944,572, Sep. 21, 1978, abandoned, which is a continuation of Ser. No. 796,073, May 12, 1977, abandoned. This application Jul. 27, 1979, Ser. No. 61,410

Int. Cl.[3] **C08G** *79/02;* **C07C** *46/00, 57/00*

U.S. Cl. 528—399 **18 Claims**

1. A compound selected from the group consisting of those represented by the formulas:

Formula I



and

Formula II

wherein X is a chromophoric group, R is an organo substituent, n is an integer from 250 to 20,000 and m is an integer no larger than n/2; including further compounds wherein the ratio of X to R is from 1:1 to 1:15,000.

4,242,500

PROCESS FOR THE REMOVAL OF FREE ACRYLATE MONOMER FROM POLYACRYLATE COMPOSITIONS BY THE ADDITION OF ALKANOLAMINES

John M. Franceschini, Lower Plenty, Australia, assignor to Fabcote Manufacturing Proprietary Limited, Boxhill, Australia

Filed May 24, 1979, Ser. No. 41,947

Int. Cl.[3] **C08F** *6/00, 6/16, 6/28*

U.S. Cl. 528—492 **12 Claims**

1. A process of lowering the free acrylate monomer content of a polymerized acrylate polymer composition comprising adding to the polymer composition an alkyl substituted or unsubstituted alkanolamine or alkanediolamine containing 2 to 8 carbon atoms, in an amount sufficient to neutralize a major amount of the free monomer.

4,242,501

PURIFICATION OF PNEUMOCOCCAL CAPSULAR POLYSACCHARIDES

Francis J. Cano, Spring Valley; Joseph S. C. Kuo, Orangeburg, both of N.Y., and Merle V. Querry, River Vale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 8, 1979, Ser. No. 64,663

Int. Cl.[3] **C07H** *3/00;* **C08B** *37/00*

U.S. Cl. 536—1 **85 Claims**

1. A process for purification of effectively immunogenic Type 1 pneumococcal capsular polysaccharide from a clarified fermentation lysate by a process comprising

(a) fractionally precipitating from 0.25 to 0.5 volumes of alcohol, the lysate being a a pH of about 6.7 and having a final sodium acetate concentration of about 4% and being at a temperature of 2°–6° C., and removing contaminants so precipitated and,

(b) precipitating Type 1 polysaccharide with from about 0.5 to about 1.0 volume of alcohol at a pH of about 6.7, and

(c) collecting and redissolving such precipitate, and

(d) repeating step a at about 0.15 to 0.35 volumes of alcohol, and

(e) repeating step b and at 0.5 to 1.0 volumes of alcohol and then repeating step c, and

(f) fractionally precipitating the redissolved precipitate of (e) with cetavlon at a temperature of from 21°–25° C. and a pH of 7.4±0.1, and a cetavlon concentration of 1.5 to 5.0 volumes percent, and based on a 10% cetavlon solution, and

(g) removing the precipitated polysaccharide and redissolving the polysaccharide in about 0.25 M NaCl while chilled, and

(h) reprecipitating the polysaccharide at a pH of about 6.7 with about 4% sodium acetate and about 1 volume of alcohol, and redissolving in pyrogen-free water, and

(i) repeating step (h) 2 times, and

(j) purifying the polysaccharide solution of (i) with activated charcoal at a pH of 6.1 and a sodium chloride concentration of 0.15 M by adding activated charcoal in suspension to concentration of from 3% to 7% based on a 20% activated charcoal suspension and the solution standing chilled for about 30 minutes and filtering out said activated charcoal, and

(k) diafiltering the solution against distilled water, and

(l) freezing and lyophilizing the resultant product.

4,242,502

ENHANCEMENT OF CHOLESTEROL COMBINING PROPERTIES OF SAPONINS

Manuel R. Malinow, Portland; Phyllis A. McLaughlin, Cornelius, both of Oreg.; George O. Kohler, El Cerrito, and Arvin L. Livingston, Martinez, both of Calif., assignors to United States of America, Washington, D.C.

Continuation of Ser. No. 865,985, Dec. 30, 1977, abandoned. This application Apr. 20, 1979, Ser. No. 31,970

Int. Cl.[2] **C07G** *3/00;* **C07J** *17/00*

U.S. Cl. 536—5 **15 Claims**

1. A method of subjecting saponins to acid hydrolysis under mild conditions to enhance their cholesterol-combining properties comprising:

(a) dissolving the saponins in an aqueous alcoholic solvent;

(b) adjusting the acidity of the saponins solution obtained in step (a) to about from 1.2 to 2.0 N;

(c) heating the aqueous alcoholic solution obtained in step (b) until refluxing of the solvent begins and thereafter maintaining the solution at gentle reflux for about from 20 to 60 minutes whereby modified saponins having enhanced cholesterol-combining properties are produced; and

(d) recovering the modified saponins obtained in step (c).

15. The modified saponins produced by the method of claim 1.

4,242,503

PROCESS FOR O-DEMETHYLATING FORTIMICINS

Paul A. Lartey, Waukegan, and David J. Grampovnik, North Chicago, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,237
Int. Cl.[3] C07H *15/22*
U.S. Cl. 536—17 R 9 Claims

1. A process for O-demethylating a fortimicin comprising the steps of reacting the fortimicin to be O-demethylated with a compound selected from the group consisting of hydriodic acid and trimethylsilyliodide, said reaction being commenced at room temperature and the temperature being gradually raised to a temperature of from 50° to 70° C. over a period of from 30 minutes to four hours, and thereafter maintaining said reaction mixture at said higher temperature for a period of from 12 to 24 hours until hydrolysis of the 3-O-methyl substituent is completed and thereafter removing said O-demethylated fortimicin from the reaction mixture.

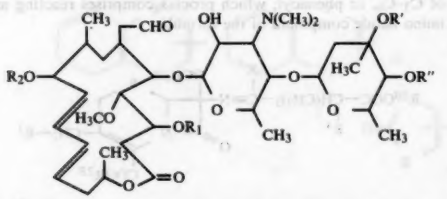
4,242,504

3''-ACYLATED MACROLIDE ANTIBIOTICS

Hideo Sakakibara, Mishima; Osamu Okegawa, Shizuoka; Toshiyuki Watanabe, Shizuoka; Tatsuro Fujiwara, Shizuoka; Susumu Watanabe, Shizuoka; Satoshi Omura, Tokyo, and Tetsuo Matsuda, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed May 10, 1979, Ser. No. 37,859
Claims priority, application Japan, May 10, 1978, 53-55876; Apr. 12, 1979, 54-44590
Int. Cl.[3] C07H *17/08*
U.S. Cl. 536—17 R 15 Claims

1. A compound of the formula



wherein R_1 is hydrogen or C_{2-3} alkanoyl, R_2 is hydrogen or C_{2-4} alkanoyl, at least one of R_1 and R_2 being hydrogen, and one of R' and R'' is R_3 and the other is R_4, in which R_3 is C_{2-6} alkanoyl and R_4 is C_{2-5} alkanoyl, or a pharmaceutically acceptable salt thereof.

4,242,505

S-ADENOSYL-L-METHIONINE COMPOSITIONS AND PRODUCTION THEREOF

Toshihisa Kawahara, and Goro Motoki, both of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Jul. 28, 1978, Ser. No. 929,294
Claims priority, application Japan, Aug. 3, 1977, 52-92552; Oct. 12, 1977, 52-121535; Dec. 30, 1977, 52-158856; May 25, 1978, 53-61597
Int. Cl.[3] C07H *19/16*
U.S. Cl. 536—26 8 Claims

1. An S-adenosyl-L-methionine composition stabilized against decomposition of S-adenosyl-L-methionine comprising S-adenosyl-L-methionine, a sulfuric acid equivalent, and a nucleoside sulfate.

4,242,506

CROSS-LINKING OF CELLULOSE SULFATE ESTERS WITH TETRAVALENT METAL IONS

Richard G. Schweiger, 1324 Rimrock Dr., San Jose, Calif. 95120

Filed Jul. 5, 1979, Ser. No. 54,683
Int. Cl.[3] C08B *5/14*
U.S. Cl. 536—59 28 Claims

1. A method of forming a cross-linked cellulose sulfate ester, said method comprising:

reacting a cellulose sulfate ester in an aqueous medium with a substantially water-soluble salt of a tetravalent metal, and

said reaction being carried out at a pH level that is as high or higher than the threshold pH level at which the cellulose sulfate ester is cross-linked by the tetravalent metal ion of said substantially water-soluble salt.

4,242,507

SULFONIC ACID ESTERS

Masumi Itoh, Takatsuki, and Jiyoji Notani, Kawanishi, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 662,033, Feb. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 465,125, Apr. 29, 1974, abandoned. This application Feb. 23, 1978, Ser. No. 880,436
Int. Cl.[3] C07D *249/18, 253/08*
U.S. Cl. 542—427 57 Claims

1. A sulfonic acid ester of the formula:

$$R_1'—SO_2—OR_2'$$

wherein R_1' is a member selected from the group consisting of alkyl having 1 to 6 carbon atoms, oxo substituted bicycloalkylalkyl having 7 to 10 carbon atoms in the bicycloalkyl moiety and having 1 to 6 carbon atoms in the alkyl moiety, phenylalkyl having 1 to 6 carbon atoms in the alkyl moiety, phenylalkenyl having 2 to 6 carbon atoms in the alkenyl moiety, phenyl, 2,4,6-trimethylphenyl, alkylphenyl having one alkyl having 1 to 6 carbon atoms in the alkyl group thereof, phenyl having 1 to 3 substituent(s) selected from the group consisting of alkenyl having 2 to 6 carbon atoms, halogen, and nitro, and β-pyridyl, and $R_2'O—$ is a member selected from the group consisting of benzotriazolyloxy, benzotriazolyloxy having one substituent selected from the group consisting of nitro, halogen and alkenyl having 2 to 6 carbon atoms, and oxo substituted dihydrobenzotriazinyloxy, with the proviso that when R_1' is phenyl having one alkyl, $R_2'O—$ is not benzotriazolyloxy.

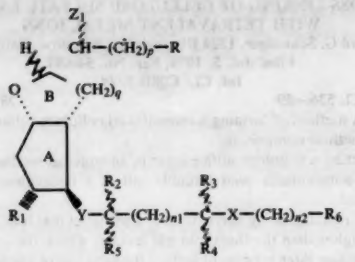
4,242,508

CERTAIN THIACYCLIC PGI COMPOUNDS

Carmelo Gandolfi, Milan; Carlo Passarotti, Gallarate; Alessandro Andreoni, Cologno Monzese; Angelo Fumagalli, Monza; Franco Faustini, Milan; Roberto Ceserani, Milan, and Maria M. Usardi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Division of Ser. No. 920,166, Jun. 29, 1978, which is a division of Ser. No. 859,703, Dec. 12, 1977, abandoned. This application Apr. 13, 1979, Ser. No. 29,921
Claims priority, application Italy, Dec. 31, 1976, 31401 A/76; Jan. 14, 1977, 19283 A/77; Mar. 14, 1977, 21171 A/77; Mar. 21, 1977, 21412 A/77; Mar. 31, 1977, 21863 A/77
Int. Cl.[3] C07D *333/24;* A61K *31/38*
U.S. Cl. 542—430 20 Claims

1. A compound of formula (I)

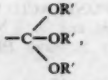


wherein

R is a member selected from the group consisting of

(a) $-COOR_c$ wherein R_c is hydrogen, C_1–C_{12} alkylor C_2–C_{12} alkenyl; or

(b)



wherein each of the R′ groups, which are the same or different, is C_1–C_6 alkyl or phenyl;

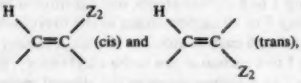
Z_1 is hydrogen or halogen;

p is zero or an integer of 1 to 7;

q is 1;

R_1 is hydrogen, hydroxy, C_1–C_6 alkoxy, benzyloxy, C_2–C_{12} alkanoyloxy or benzoyloxy;

Y is a member selected from the group consisting of $-CH_2-CH_2-$, $-C\equiv C-$,



wherein Z_2 is hydrogen or halogen;

one of R_2 and R_5 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl or phenyl, α-naphthylor β-naphthyl, and the other is hydroxy, C_1–C_6 alkoxy, benzyloxy, or R_2 and R_5, taken together, form an oxo group;

each of R_3 and R_4, which are the same or different, may be hydrogen, C_1–C_6 alkyl or fluorine or R_3 and R_4, taken together, with the carbon atom to which they are linked, form the radical

or the radical

each of n_1 and n_2, which are the same or different, is zero or an integer of 1 to 6;

X is a member selected from the group consisting of —O—, —S— and $-(CH_2)_m-$, wherein m is zero or 1;

R_6 is tetrahydro thienyl or a heterobicyclic ring selected from the group consisting of thiabicyclooctyl and thiabicyclo-nonyl, and the pharmaceutically or veterinarily acceptable salts thereof.

11. A pharmaceutical or veterinary composition, suitable for use as a hypotensive agent, said composition comprising a therapeutically effective amount of a compound as claimed in any of claims 1 to 10, and a pharmaceutically and/or veterinarily acceptable carrier and/or diluent.

4,242,509

PROCESS FOR PRODUCING 7-AMINO-7-ALKOXYCEPHALOSPORINS

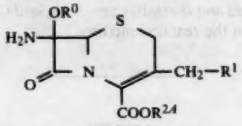
William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 853,063, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 298,165, Oct. 16, 1972, abandoned. This application Apr. 13, 1979, Ser. No. 29,792

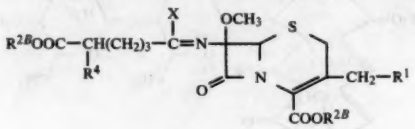
Int. Cl.³ C07D 501/18

U.S. Cl. 544—21 **6 Claims**

1. The process for preparing a compound of the formula:



wherein R° represents primary loweralkyl of C_1–C_4 or methyl-d_3; R^1 represents acetoxy, carbamoyloxy, α-methoxy-p-hydroxycinnamoyloxy, propionyloxy, benzoyloxy, methoxy, methylthio, 1-methyl-1,2,3,4-tetrazol-5-ylthio, or 5-methyl-1,3,4-thiadiazol-2-ylthio; R^{2A} represents hydrogen or R^2; and R^2 represents alkyl of C_1–C_6, 2,2,2-trichloroethyl, 2-iodoethyl, tert-alkenyl of C_5–C_7, tert-alkynyl of C_5–C_7, benzyl, ar-nitrobenzyl, tetrahydropyranyl, succinimidomethyl, phthalimidomethyl, ar-methoxybenzyl, ar, ar-dimethoxybenzyl, cyanomethyl, nitrophenyl, dinitrophenyl, 2,4,6-trinitrophenyl, bis(p-methoxyphenyl)methyl, triphenylmethyl, diphenylmethyl, benzyloxymethyl, loweralkanoyloxymethyl of C_3–C_6, or phenacyl; which process comprises reacting an imino halide compound of the formula:



wherein X represents bromide or chloride; R^1 is as defined above; R^{2B} represents R^2 as defined above, loweralkanoyl of C_2–C_4 or radical of the formula:

wherein each R^3 independently represents loweralkyl of C_1–C_4 or halo selected from the group consisting of bromo, chloro, fluoro, and iodo subject to the limitation that at least one R^3 represents loweralkyl as defined; and R^4 represents an acylamido group wherein the acyl is

alkanoyl of C_1–C_4,

benzoyl,

naphthoyl,

alkoxycarbonyl of C_2–C_5,

cycloalkoxycarbonyl of C_6–C_7,

benzyloxycarbonyl,

naphthyloxycarbonyl,

one of the above groups substituted with from one to three groups, each selected from the group consisting of halo, nitro, loweralkoxy of C_1–C_4, cyano, and in the instance of

benzoyl, naphthoyl, benzyloxy, and naphthyloxy, by lower alkyl of C_1–C_4, or

phthaloyl;

with an alcohol of the formula R^*—OH under essentially non-aqueous conditions.

4,242,510

CEPHALOSPORIN COMPOUNDS AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Sakai; Takashi Masugi, Kitamachi; Takashi Ogino, Kobe, and Kiyoshi Tsuji, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

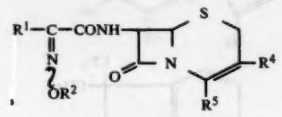
Continuation-in-part of Ser. No. 863,923, Dec. 23, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,858

Claims priority, application Japan, Dec. 27, 1976, 51-160698

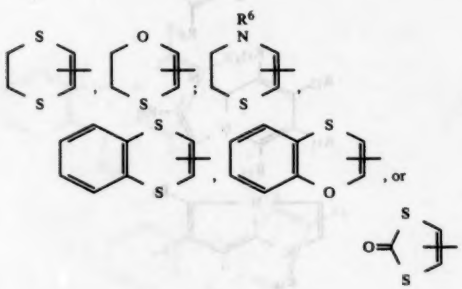
Int. Cl.³ C07D *501/56*

U.S. Cl. 544—27 **21 Claims**

1. A compound of the formula:



wherein R^1 is a group of the formula:



wherein

R^6 is hydrogen or lower alkanoyl,

R^2 is hydrogen, lower alkyl or lower alkenyl,

R^4 is a 5-membered heterocyclic-thiomethyl having carbon and nitrogen or carbon, nitrogen and a single sulfur atom in the heterocyclic ring, which may be substituted with one lower alkyl, wherein the heterocyclic group is attached by way of ring carbon to thiomethyl,

R^5 is carboxy or its ester, and a non-toxic pharmaceutically acceptable salt thereof.

4,242,511

PRODUCTION OF AMINE SALTS OF ACID O,S-DIALKYLTHIOPHOSPHORIC ACID

Jürgen Grosse, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

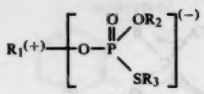
Filed Sep. 4, 1979, Ser. No. 72,084

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1978, 2838933

Int. Cl.³ C07D *295/00*; C07F *9/165, 9/65*

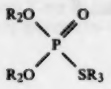
U.S. Cl. 544—110 **7 Claims**

1. In the process for making amine salts of acid O,S-dialkylthiophosphoric acid esters of the general formula (I)



(I)

in which R_1 stands for the C_1–C_{18} ammonium ion of a substituted or unsubstituted primary or secondary aliphatic, cycloaliphatic or aromatic amine or of a heterocyclic nitrogen base, and R_2 and R_3 each stand for an alkyl group having 1 to 4 carbon atoms, by subjecting an O,O,S-trialkyl-thiophosphate to partial dealkylation and forming the salt of the dealkylated product by treatment with an amine corresponding to the ammonium ion R_1, the improvement which comprises: mixing an O,O,S-trialkylthiophosphate of the general formula (II)



(II)

in which R_2 and R_3 have the meanings given above, with water and an amine corresponding to the ammonium ion R_1, employing 2 Mols of amine and 1 to 12 Mols of water per mol of phosphate, reacting the resulting mixture, with agitation, over a period of about 3 to 8 hours at a temperature within the range about 0° to 120° C., and separat-ing the amine salt of the general formula (I) from the reaction mixture.

4,242,512

NOVEL THIOAMIDE DERIVATIVES CONTAINING A PYRIDAZINE GROUP

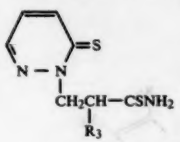
Masahiro Takaya; Toshihiro Yamada, both of Shiga, and Tomokazu Yuizono, Kyoto, all of Japan, assignors to Morishita Pharmaceutical Co., Ltd., Japan

Continuation-in-part of Ser. No. 872,367, Jan. 26, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 63,869

Int. Cl.³ C07D *237/08, 237/14, 237/18*; A61K *31/50*

U.S. Cl. 544—239 **7 Claims**

1. A thioamide having the formula



wherein R_3 is hydrogen or methyl.

4. 3-(3-oxo-2-pyridazinyl) thiopropionamide.

5. 3-(3-oxo-6-phenyl-2-pyridazinyl) thiopropionamide.

6. N-methyl-3-(3-oxo-2-pyridazinyl) thiopropionamide.

7. N-methyl-3-methyl-3-(3-oxo-2-pyridazinyl) thiopropionamide.

4,242,513

LACTONE COMPOUNDS CONTAINING A HETEROCYCLIC RADICAL

Troy E. Hoover; Sheldon Farber, and William J. Becker, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 5, 1979, Ser. No. 17,765

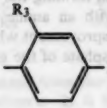
Int. Cl.³ C07D *491/048*

U.S. Cl. 544—345 **21 Claims**

1. A material selected from the group consisting of (a) a compound represented by the formula:

(I)

wherein A is:



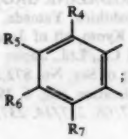
X is:

or morpholino;

R_1 and R_2 are: hydrogen, alkyl or phenyl;

R_3 is: hydrogen or alkoxy;

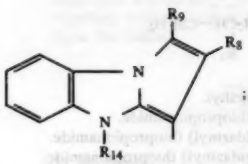
E is:

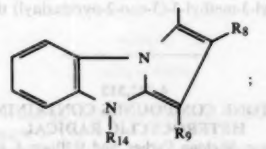


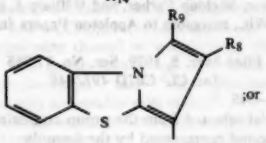
R_4, R_5, R_6 and R_7 are: hydrogen, halogen, or dialkylamino;

B is:

Y;







;or

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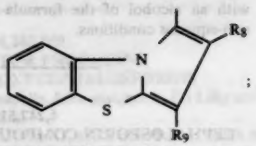
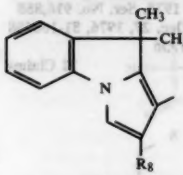
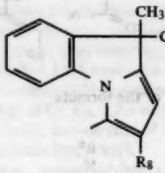
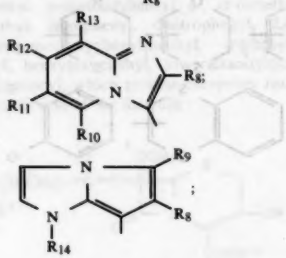
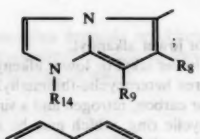


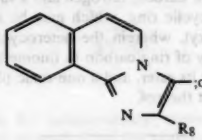
Y is:

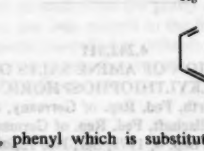




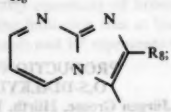








;or



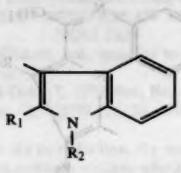
R_8 is phenyl, phenyl which is substituted by metoxy or dimethyl/amino, naphthyl or alkyl;

R_9 is hydrogen, alkyl or phenyl;

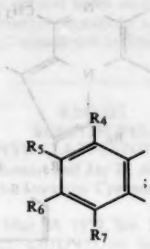
R_{10}, R_{11}, R_{12} and R_{13} are hydrogen, alkyl or nitro; and

R_{14} is hydrogen or alkyl;

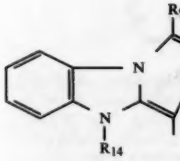
(b) a compound represented by the formula (I) wherein A is:

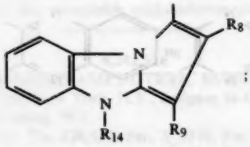


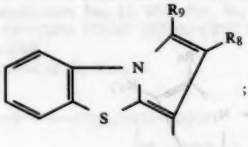
E is:

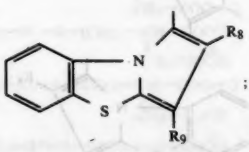


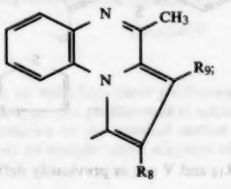
B is:
Y;











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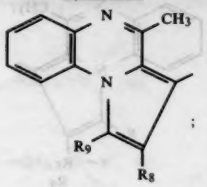
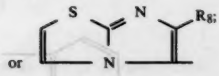
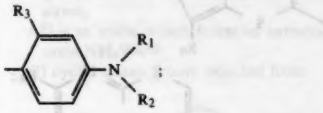
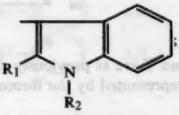
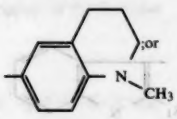


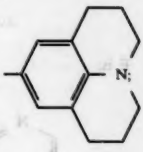


and
R_1 through R_{14} and Y are as previously defined;
(c) a compound represented by the formula (I) wherein A is:

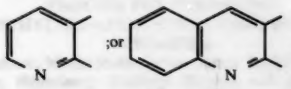




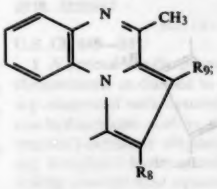




E is:



B is:
Y;



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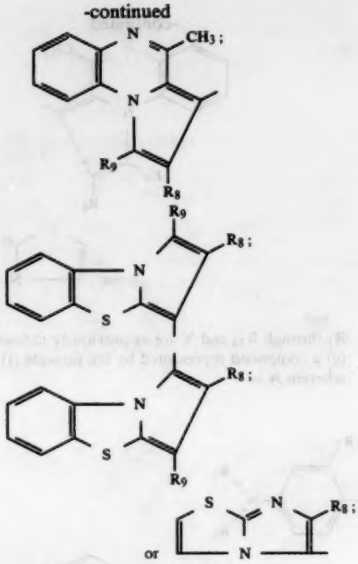
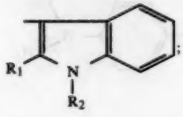


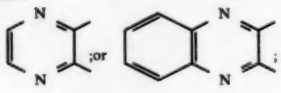
and

R_1 through R_{14} and Y are as previously defined;

(d) a compound represented by the formula (I) wherein A is:

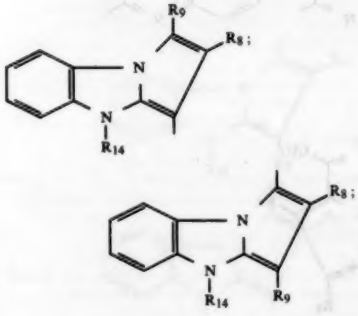


E is:



B is:

Y;



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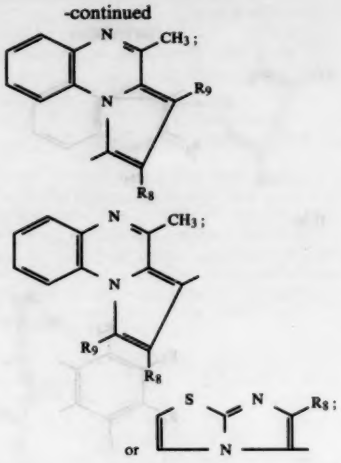
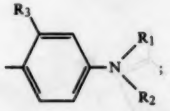
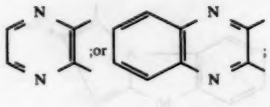


R_1 through R_{14} and Y are as previously defined;

(e) a compound represented by the fiormula (I) wherein A is:

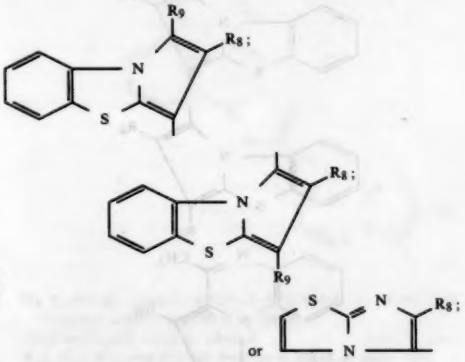


E is:



B is:

Y;



and

R_1 through R_{14} and Y are as previously defined.

4,242,514

METHOD FOR THE INTRODUCTION OF A METHYL GROUP INTO THE 7 POSITION OF THE MORPHINAN NUCLEUS

David L. Leland, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 17, 1979, Ser. No. 85,775
Int. Cl.[3] C07D *221/28, 489/02*
U.S. Cl. 546—74 17 Claims

1. A method for the introduction of a methyl group into the 7-position of the morphinan nucleus which method comprises reacting, in an inert solvent under an inert atmosphere, thebaine with lithium dimethyl cuprate for a time sufficient to form 3,6-dimethoxy-7β,17-dimethyl-4-hydroxy-5,6,8,14-tetrahydromorphinane.

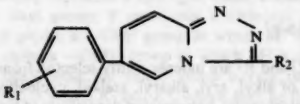
4,242,515

SUBSTITUTED 3-ALKYL-6-PHENYL-1,2,4-TRIAZOLO-[4,3-a]PYRIDINES

Ronald I. Trust, Monsey, and Jay D. Albright, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 28, 1979, Ser. No. 24,849
Int. Cl.[3] C07D *471/04;* A61K *31/41*
U.S. Cl. 546—119 7 Claims

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, alkyl (C_1–C_4), alkoxy (C_1–C_4), fluoro, chloro, bromo, trifluoromethyl, cyano, carboxy, alkoxycarbonyl (C_2–C_5), carboxamido, nitro, amino, acetylamino, monoalkylamino (C_1–C_4) or dialkylamino wherein each alkyl group has up to 4 carbon atoms and R_2 is alkyl (C_1–C_3); and the pharmacologically acceptable acid-addition salts thereof.

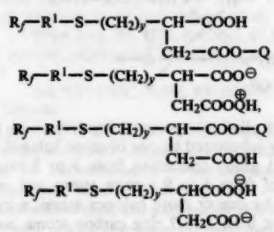
4,242,516

FLUORINATED AMPHOTERIC SURFACTANTS

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 538,432, Jan. 3, 1975, Pat. No. 4,069,244. This application Jan. 12, 1978, Ser. No. 868,772
Int. Cl.[2] C07D *295/14, 207/04;* C07C *101/04*
U.S. Cl. 546—248 10 Claims

1. A compound of the formula



I.

II

wherein

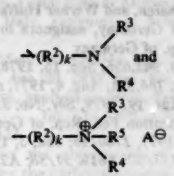
R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by heptafluoroisopropoxy on the terminal carbon atom;

R′ is branched or straight chain alkylene of 1 to 12 carbon atoms,

y is 1, zero;

Q is a nitrogen containing group selected from

(1) an aliphatic amino group selected from



(1a)

(1b)

wherein

R^2 is a linear or branched alkylene of 2 to 12 carbon atoms, or

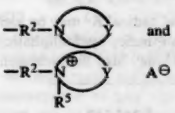
k is 1;

R^3 and R^4 are independently of each other linear or branched alkyl groups of 1 to 20 carbon atoms or phenyl groups;

R^5 is hydrogen, benzyl, an alkyl group or hydroxyalkyl group, wherein said alkyl group contains 1 to 18 carbon atoms;

$A^\ominus$ is an anion which forms an ammonium salt of the formula $NH_4^\oplus A^\ominus$;

(2) cyclic amino groups selected from



(2a)

wherein Y is a diradical of the formulae

$$-(CH_2)_4-$$

or

$$-(CH_2)_5- \text{ or } -(CH_2)_2-O-(CH_2)_2$$

wherein R^2, R^5 and A are as defined above.

4,242,517

PROCESS FOR PREPARING 4-METHYL-5[(2-AMINOETHYL)THIOMETHYL)]-IMIDAZOLE

Toni Dockner, Meckenheim; Anton Frank, Ludwigshafen; Uwe Kempe, Heidelberg; Matthias Wetzler, and Helmut Karn, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 3,966, Jan. 16, 1979, abandoned. This application Aug. 8, 1979, Ser. No. 64,909
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825547
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—342 1 Claim

1. A process for the preparation of [4-methyl-1-hydroxymethylimidazole as claimed in claim 3 and reaction of the resulting compound with cysteamine in boiling concentrated aqueous hydrochloric acid to give] 4-methyl-5[(2-aminoethyl)-thiomethyl]-imidazole dihydrochloride which comprises: reacting 4-methyl-1-hydroxymethylimidazole with cysteamine in boiling concentrated aqueous hydrochloric acid.

4,242,518

THIOPHENE COMPOUNDS AND THEIR MANUFACTURE

Phillip Rossy, Ludwigshafen, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

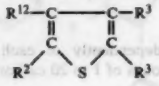
Division of Ser. No. 942,655, Sep. 15, 1978, which is a continuation of Ser. No. 784,571, Aug. 4, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 31,593

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615885; Jan. 3, 1977, 2700215; Jan. 3, 1977, 2700262

Int. Cl.[3] **C07D** *333/00;* **A61K** *31/38;* **A23L** *2/26*

U.S. Cl. 549—61 **1 Claim**

1. Thiophene compounds of the formula



Ia

where R^{12} is

R^2 is —CN the individual radical R^3 may be identical or different and each is an an aliphatic, cycloaliphatic, araliphatic or aromatic radical, and R^3 may also be hydrogen.

4,242,519

NOVEL α-THIO-ALKANOIC ACID DERIVATIVES

Genichi Tsuchihashi, Tama; Katsuyuki Ogura, and Shuichi Mitamura, both of Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Japan

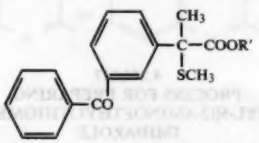
Continuation of Ser. No. 843,343, Oct. 18, 1977, abandoned. This application Mar. 13, 1979, Ser. No. 20,231

Claims priority, application Japan, Oct. 18, 1976, 51-123903; Oct. 18, 1976, 51-123904; Dec. 27, 1976, 51-156358; Dec. 27, 1976, 51-156360

Int. Cl.[3] **C07C** *149/40, 151/00;* **A61K** *31/235, 31/19*

U.S. Cl. 560—15 **1 Claim**

1. Alpha-methylthio-α-(m-benzoylphenyl)propionic acid and its esters of the formula



wherein R′ represents H or C_1–C_4 alkyl.

4,242,520

PROMOTED METHOD FOR PRODUCING CARBAMATES

David Moy, Ridgewood, N.J., assignor to Halcon Research & Development Corporation, New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,105

Int. Cl.[3] **C07C** *125/063, 125/07*

U.S. Cl. 560—24 **12 Claims**

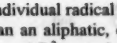
1. A process for producing carbamates from a reactant consisting essentially of an aromatic primary or secondary amine of the formula:

(i) RNH_2,

(ii) RNH(R′), or

(iii) $R(NH_2)_m$

wherein R and R′ are independently selected from the group consisting of aryl and alkaryl and wherein "m" is an integer of from 1 to 5, said aromatic amine being free of substitution by OH—, >C=O or sulfonic acid groups, said process comprising contacting said aromatic amine reactant in a reaction zone under substantially anhydrous conditions with (1) a source of carbon monoxide, (2) an organic compound which contains at least one hydroxyl group per molecule and which comprises a member selected from the group consisting of monohydric and polyhydric compounds of the formula $Z(OH)_n$, wherein "n" is an integer of at least one and "Z" is an aromatic, aliphatic, cycloaliphatic or araliphatic group or a substituted derivative or any of the foregoing groups wherein the substituent comprises members selected from the group consisting of sulfoxide, amide, sulfone and carboxylic ester groups, and (3) a member selected from the group consisting of elemental sulfur, elemental selenium, elemental tellurium, sulfur compounds, selenium compounds and tellurium compounds, in the presence of a catalyst for the reaction, said catalyst consisting essentially of either an organic base or an inorganic base selected from the group consisting of nonhalide compounds and complexes of at least one metal selected from the group consisting of lithium, beryllium, sodium, magnesium, potassium, calcium, rubidium, iron, chromium, nickel, molybdenum, tungsten, aluminum, gallium, indium, thallium, copper, titanium, vanadium, cesium, manganese, strontium, barium, cobalt, rhenium and platinum, or mixtures thereof, and in the presence of at least one disulfide of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, cycloalkyl, alkenyl, alkynyl, heterocyclic, halogenated derivatives of the foregoing groups, and derivatives of the foregoing groups in which one or more carbon atom is replaced by an oxygen atom, to form the carbamate corresponding to said aromatic amine reactant and said hydroxyl-containing organic compound.

4,242,521

CYCLOPROPANECARBOXYLATE PESTICIDES

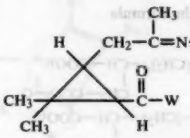
James E. Powell, Ripon, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 50,735, Jun. 21, 1979. This application Jan. 25, 1980, Ser. No. 115,465

Int. Cl.[3] **A01N** *37/08, 37/50;* **C07C** *119/00*

U.S. Cl. 560—35 **4 Claims**

1. A compound of the formula



wherein R^1 is an alkyl group containing from 1 to 10carbon atoms optionally substituted by one or more halogen atoms; a (cycloalkyl)alkyl group containing from 3 to 7 ring carbon atoms, a total of from 4 to 9 carbon atoms and optionally ring-substituted by one or more halogen atoms; a cycloalkyl group containing from 3 to 7 ring carbon atoms; an alkenyl group containing from 2 to 4 carbon atoms optionally substituted by one or more halogen atoms or alkynyl group containing from 2 to 4 carbon atoms or an aryl group containing from 6 to 12 carbon atoms or an aralkyl group containing from 7 to 10 carbon atoms, each optiionally ring-substituted by one or more halogen atoms; W is a chlorine or bromine atom or —OR in which R is a hydrogen atom, a salt-forming cation or an alkyl group containing from 1 to 20 carbon atoms.

4,242,522

O-(N-ALLYL-2,6-DICHLOROANILINO)PHENYLACETIC ACID DERIVATIVE AND A PROCESS FOR PREPARING THE SAME

Genichi Tsuchihashi, Tama; Katsuyuki Ogura, Sagamihara; Ryozo Sakoda, Funabashi; Isao Hashiba, Funabashi, and Shuichi Fukushima, Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd. and Sagami Chemical Research Center, both of Tokyo, Japan

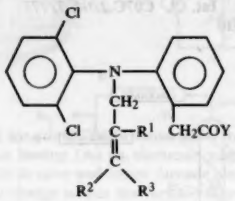
Filed Sep. 17, 1979, Ser. No. 75,909

Claims priority, application Japan, Sep. 27, 1978, 53/118026

Int. Cl.[3] C07C *101/453, 83/10, 103/28*

U.S. Cl. 560—47 14 Claims

1. An o-(N-allyl-2,6-dichloroanilino)phenylacetic acid derivative represented by the formula:



wherein R^1, R^2 and R^3, which may be the same or different, individually represent a hydrogen atom, a halogen atom or an alkyl group; Y represents a hydroxyl group, an alkoxyl group, a $—OM^1$ group in which M^1 is an alkali metal atom, a $—OM_1{}^2$ group in which M^2 is an alkaline earth metal atom, an amino group having the formula $—NR^5R^6$ in which R^5 and R^6, which may be the same or different, individually represent a hydrogen atom or an alkyl group, or a hydroxylamino group.

4,242,523

PROCESS FOR THE PREPARATION OF PARA-NITROSO-DIPHENYL-HYDROXYLAMINES

Paul K. Battey, Ormskirk, England; Manfred Bergfeld, Erlenbach, Fed. Rep. of Germany, and Peter Hope, Liverpool, England, assignors to Akzona Incorporated, Asheville, N.C.

Filed Aug. 20, 1979, Ser. No. 67,784

Claims priority, application United Kingdom, Aug. 18, 1978, 33790/78

Int. Cl.[3] C07C *79/46, 85/24, 101/72*

U.S. Cl. 560—48 9 Claims

1. In a process for the preparation of para-nitroso-diphenyl-hydroxylamines wherein one member selected from the group consisting of nitrosobenzene, ortho-substituted nitrosobenzenes, meta-substituted nitrosobenzenes, ortho-meta-disubstituted nitrosobenzenes, and para-substituted nitrosobenzenes, is reacted with one member selected from the group consisting of nitrosobenzenes, ortho-substituted nitrosobenzenes, meta-subsituted nitrosobenzenes, and ortho-meta-disubstituted nitrosobenzenes in the presence of an acid catalyst, the improvement comprising utilizing as the acid catalyst a Lewis acid, in an amount equal to or greater than 0.5 mol of acid per mol of nitroso reactants, and performing the reaction at a temperature from about −20° C. to about 60° C.

4,242,524

PROCESS FOR THE PREPARATION OF 2-(4'-NITROPHENYL)-PROPIONIC ACID

Carlo Venturello, Turin; Rino D'Aloisio, Novara, and Aldo Belli, Intra, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 894,346, Apr. 7, 1978. This application Apr. 20, 1979, Ser. No. 31,916

Claims priority, application Italy, Feb. 9, 1978, 20095 A/78

Int. Cl.[3] C07C *51/15*

U.S. Cl. 562—423 6 Claims

1. Process for the preparation of 2-(4'-nitrophenyl)-propionic acid (I) by the carboxylation of para-nitroethylbenzene in a solvent, under substantially atmospheric pressure, and at a temperature of between about 20° and 50° C., in the presence of an alkaline phenate selected from the group consisting of potassium and sodium to form the corresponding potassium or sodium salt of the acid, characterized in that the reaction is conducted in dimethylsulphoxide.

4,242,525

PROCESS FOR PRODUCING SALTS OF PYRUVIC ACID

Tadamitsu Kiyoura, Kamakura, Japan, assignor to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,695

Claims priority, application Japan, Apr. 17, 1978, 53-44267; Aug. 31, 1978, 53-105619; Jan. 19, 1979, 54-3992

Int. Cl.[3] C07C *59/19*

U.S. Cl. 562—577 22 Claims

1. A process for producing a salt of pyruvic acid by the oxidation of a salt of lactic acid which comprises oxidizing at a temperature of from room temperature to 100° C. a 2–30 weight 0/0 concentration of said salt of lactic acid with an oxygen-containing gas in a water-containing solvent in the presence of a catalyst comprising (a) at least one component selected from the group consisting of platinum and palladium and (b) a component selected from the group consisting of lead, tin, tellurium, indium, bismuth, and oxides, hydroxides, nitrates, sulfates, halides, carbonates, acetates and propionates of these elements, whereby forming the salt of pyruvic acid.

4,242,526

PROCESS FOR THE DIRECT SEPARATION OF ISOBUTYLENE FROM MIXTURES OF HYDROCARBONS

János Laky; Rezsö Csikós, both of Veszprém; Lajos Péterfy, Balatonkenese; Lajos Szvetelszky, Répcelak, and István Pallay, Budapest, all of Hungary, assignors to Magyar Ásványolaj és Földgáz Kisérleti Intézet, Veszprém, Hungary

Continuation of Ser. No. 729,784, Oct. 5, 1976, abandoned. This application Mar. 8, 1978, Ser. No. 884,607

Int. Cl.[2] C07C *41/06, 41/10*

U.S. Cl. 568—697 1 Claim

1. A process for producing methyl tertiary butyl ether from a mixture of C_4 hydrocarbons containing isobutylene and butadiene, comprising the steps of selectively reacting the isobutylene with a greater than stoichiometric amount of methanol, at a temperature of 50 to 120 degrees C., in a homogeneous liquid phase and in the presence of a catalytic amount of sulfuric acid, said sulfuric acid being present in an amount less than 20% by weight based on the weight of the reaction mixture, said homogeneous liquid phase being maintained throughout the reaction, whereby a reaction mixture containing methyl tertiary butyl ether is produced and undesired polymerization of the budadiene is avoided; cooling the reaction mixture then adding to it reaction mixture which has been washed free of methanol or separated unreacted C_4 fraction which is isobutylene-free whereby an upper phase containing hydrocarbons and methyl tertiary butyl ether and a part of the methanol and a lower phase containing methanol and 10 to 50% sulfuric acid is formed; and recirculating the lower phase as a catalyst to said step of selectively reacting the isobutylene with methanol.

4,242,527

PROCESS FOR PURIFYING CRUDE DIPHENOLS

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 755,982, Dec. 30, 1976, abandoned. This application May 23, 1979, Ser. No. 41,642
Claims priority, application France, Dec. 28, 1977, 77 39515; Japan, Dec. 28, 1977, 52-157557; Fed. Rep. of Germany, Dec. 29, 1977, 2758565; Netherlands, Dec. 29, 1977, 7714564
Int. Cl.[3] C07C 37/72
U.S. Cl. 568—724 10 Claims

1. A process for purifying crude diphenols to recover the p,p'-diphenol isomer which comprises (a) dispersing the crude diphenol in a system of water and a monohydroxylic alcoholic or phenolic co-solvent or mixtures of co-solvents so that the p,p'-diphenol and the more soluble impurities are dissolved in the system at a temperature that is at or near the boiling point of water or at or near the boiling point of the water/co-solvent system; (b) removing the less soluble impurities from the system; and (c) cooling the system to achieve the separation of the purified p,p'-diphenol.

4,242,528

PROCESS FOR PREPARING ISOPROPENYL PHENOL

Nobukatu Kato, Tokai; Tsutomu Takase, Nagoya; Yoshio Morimoto, Tokai; Teruo Yuasa, and Minoru Hattori, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Aug. 1, 1979, Ser. No. 62,811
Claims priority, application Japan, Aug. 15, 1978, 53-98721
Int. Cl.[3] C07C 39/06
U.S. Cl. 568—781 12 Claims

1. A process for producing isopropenyl phenol by the thermal decomposition of oligomers of isopropenyl phenol, which comprises continuously feeding said oligomers into an inert organic reaction medium, said inert organic reaction medium consisting of a high boiling inert organic solvent which has a melting or softening point of not more than 150° C. and a lower vapor pressure than the vapor pressure of the resulting isopropenyl phenol after thermal decomposition temperature of said oligomers of isopropenyl phenol, heating said reaction medium to a temperature of 150° to 250° C., at a pressure of 10 to 100 mmHg, at such a rate that the concentration of said oligomers in the reaction medium is maintained at not more than 30% by weight, thereby thermally decomposing said oligomers in said reaction medium; and distilling off the resulting isopropenyl phenol continuously out of the reaction system and recovering it.

4,242,529

HYDROGENOLYSIS OF 2,5-NORBORNADIENE SATURATED ENDO-ENDO HEXACYCLIC DIMER

Abraham Schneider, Overbrook Hills, and Harry K. Myers, Jr., Aston, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sep. 15, 1978, Ser. No. 942,860
Int. Cl.[2] C09C 13/28
U.S. Cl. 585—353 9 Claims

1. Process for the liquid phase hydrogenolysis of a saturated endo-endo dihydronorbornadiene hexacyclic dimer comprising:

(a) contacting a dimer having the following structure,

with a catalytic amount of a Group VIII metal and in the presence of hydrogen;

(b) having the contacting occur, in the absence of a solvent, at a temperature in the range between from about 50° C. to about 350° C.; and

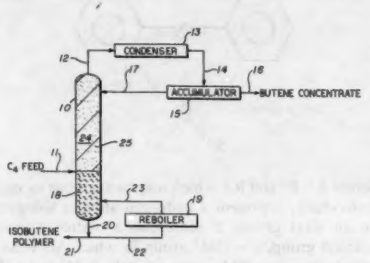
(c) continuing the contacting until the cyclopropane ring of the dimer is opened.

4,242,530

PROCESS FOR SEPARATING ISOBUTENE FROM C_4 STREAMS

Lawrence A. Smith, Jr., Houston, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

Filed Jul. 27, 1978, Ser. No. 928,397
Int. Cl.[3] C07C 2/04, 7/177
U.S. Cl. 585—510 14 Claims



1. A method of separating isoolefins from a mixture containing isoolefins and normal olefins comprising:

(a) feeding a mixture containing an isoolefin and the corresponding normal olefin to a distillation column reactor into a feed zone,

(b) concurrently in said distillation column reactor:

(1) contacting said mixture with a fixed bed acidic cation exchange resin, thereby catalytically reacting the isoolefin with itself to form a dimer, and

(2) fractionating the resulting mixture of dimer and normal olefin in said fixed bed acidic cation exchange resin,

(c) withdrawing the dimer from the distillation column at a point below said feed zone, and

(d) withdrawing the normal olefin from the distillation column at a point above the acidic cation exchange resin.

4,242,531

OLEFIN DIMERIZATION

Cecil O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 14, 1978, Ser. No. 933,345
Int. Cl.[3] C07C 3/10, 3/18, 3/21
U.S. Cl. 585—512 17 Claims

1. In a process for dimerizing an olefin which comprises:

introducing said olefin into a continuous closed path reaction zone,

reacting said olefin in the presence of a catalyst selective to dimerization and such conditions to result in the dimerization of the olefin,

flashing the reaction mixture in a flashing zone to thereby form a flashed vapor and resultant liquid,

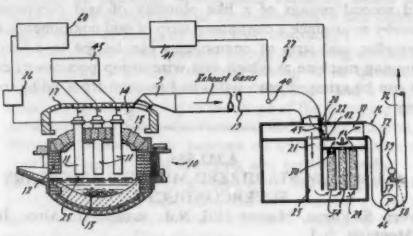
recovering the product dimer from the flashed vapor of the flashing zone the improvement comprising carrying out said flashing in the shell side of a heat exchanger which is located in said continuous closed path reaction zone thereby removing part of the thermal heat of the dimerization.

4,242,532

METHOD OF CONTROLLING EXHAUST GAS EMISSIONS FROM AN ELECTRIC ARC FURNACE

John D. Squibbs, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1979, Ser. No. 106,204
Int. Cl.[3] H05B 7/144; F27D 17/00
U.S. Cl. 13—34 8 Claims



1. A method for controlling exhaust gases from a direct arc electric furnace having (A) an electrode suspension control system effective to raise and lower furnace electrodes in relation to a metal charge within the furnace thereby to regulate the arc gap between said electrodes and said metal, (B) an exhaust conditioning system effective to collect gases generated by operation of said furnace and deliver said gases to a treatment station for removal of air pollutants from said gases, and (C) bypass means effective for diverting said gases away from said treatment station when the temperature of said gases exceeds a predetermined temperature, said method comprising:

(1) at a sensing location in said exhaust conditioning system positioned upstream from the entrance to said treating station, continuously sensing the temperature of said gases and generating a control signal having a strength directly proportional to the temperature sensed,

(2) dividing said continuous control signal into three categories based on the strength of said continuous control signal, said three categories including (a) a first category comprising strength levels below a first actuation level, (b) a second category comprising strength levels at and above said first actuation level, but below a second actuation level, and (c) a third category comprising strength levels at or above said second actuation level, said second actuation level indicating a measurably higher gas temperature at said sensing location than the gas temperature at said sensing location at said first actuation level,

(3) directing said gases in said exhaust conditioning system into said treatment station when said control signal is in said first category or said second category,

(4) actuating said electrode suspension control system to alter the arc gap to regulate the current to said metal when said control signal is in said second category, and

(5) actuating said bypass means whereby said gases are diverted away from said treatment station when said control signal is in said third category.

4,242,533

TEST STATION APPARATUS

Norris E. Cott, 216 Trinity Dr., McMurray, Pa. 15317

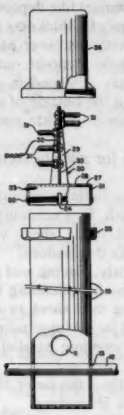
Continuation-in-part of Ser. No. 788,285, Apr. 18, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 940,816
Int. Cl.[3] H02G 9/02, 3/08; H05K 5/00
U.S. Cl. 174—38 33 Claims

33. A test station apparatus to monitor electrical currents and potentials in test leads coupled with piping, cables and the like, said apparatus including the combination of:

a collar including a side wall having threads on the surface thereof and slotted openings at spaced peripheral locations, said collar including an end wall having an opening to pass test leads through the collar,

a nut member having a threaded surface for mating engagement with the threads on said collar,

a support member engaging said collar for attachment thereto by said nut member,



means including a terminal block extending from said end wall to traverse across the opening in the end wall of said collar such that opposed face surfaces of the terminal block overlie segments of the opening,

terminals carried by said terminal block for coupling to test leads when extending through either segment of the opening, and

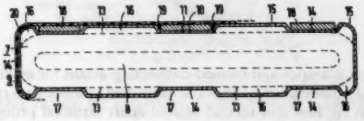
cover means to enclose said terminals.

4,242,534

SUPERCONDUCTOR STRUCTURE AND METHOD FOR MANUFACTURING SAME

Helmut Marsing, Neunkirchen a. Br., Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,426
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1978, 2809573
Int. Cl.[3] H01B 7/34
U.S. Cl. 174—15 S 14 Claims



1. A conductor structure comprising:

(a) at least one inner ribbon shaped superconductor which is stabilized with normally conducting material, said superconductor extending in the longitudinal direction of said structure;

(b) a jacket which consists of a reinforcement material with a mechanical strength higher than the normally conducting stabilizing material, formed by a metal sheet which is bent around said superconductor with the longitudinal edges of said metal sheet abutting and joined to each other so as to completely and immovably enclose said superconductor;

(c) said sheet preprofiled so that it contains first strip like zones which extend in the longitudinal direction of the conductor and make direct contact with the superconduc-

tor and second strip like zones extending between the first zones and spaced from the surface of the superconductor, the space between said second zones and said superconductor forming channels in the interior of said structure for conducting a cooling medium in the longitudinal direction of the conductor, said first and second zones also forming channel like depressions in the outside jacket; and

(d) filler strips of a thickness such that their outer flat sides, together with the outer parts of the jacket form at least approximately a smooth outer surface of the superconductor structure, disposed in and essentially filling said depressions in the outside of said jacket to form an approximately smooth outside surface for the conductor structure.

4. A method for manufacturing a superconductor structure comprising:

(a) shaping an initially smooth metal sheet with a predetermined width, in a non-cutting forming operation, into a preprofiled metal sheet with longitudinally extending channel like depressions;

(b) subsequently, placing said preprofiled metal sheet around a longitudinally extending ribbon shaped superconductor and closing said sheet to form a jacket, so as to form within said jacket longitudinally extending inner and outer channels extending parallel to said longitudinally extending conductors; and

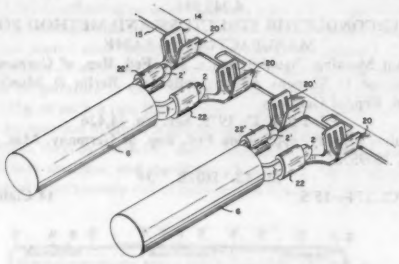
(c) finally, filling the outer channel like depressions of the jacket with filler strips.

4,242,535

CONNECTION OF WIRES TO COMPONENTS HAVING TWO PRONGS

George R. Defibaugh, Camp Hill; Suel G. Shannon, Harrisburg, and Robert C. Swengel, Jr., York, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 27, 1979, Ser. No. 79,649
Int. Cl.³ H01R *4/18*
U.S. Cl. 174—88 R **10 Claims**



1. Stamped and formed connecting means for making electrical connections of wires to electrical components of the type having first and second spaced-apart terminal prongs extending therefrom, said connecting means comprising:

a continuous carrier strip,

a plurality of sets of crimpable splicing devices integral with said carrier strip, each of said sets comprising first and second splicing devices which extend from one side edge of said carrier strip in side-by-side spaced-apart relationship,

said first splicing device of each set comprising a wire crimp portion, a prong crimp portion, and a connecting transition portion, said wire crimp portion having a wire crimp web and wire crimp sidewalls, said prong crimp portion having a prong crimp web and prong crimp sidewalls, said wire crimp portion being adjacent to said carrier strip and being integral at one end of said wire crimp web with said one side edge of said carrier strip,

said prong crimp portion of said first splicing device being spaced from said wire crimp portion, said connecting transition portion extending from said wire crimp web to said prong crimp web,

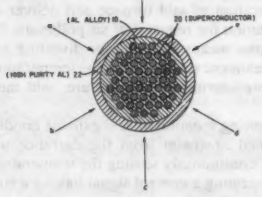
said first and second splicing devices of each set being substantially symmetrical with respect to an axis of symmetry which extends normally of said carrier strip and medially between said first and second splicing devices, whereby, said first and second prong crimp portions of a plurality of said sets can be crimped in a first crimping machine onto said first and second prongs of a like plurality of said components thereby to produce a continuous strip of said components, and thereafter said strip of components can be fed to a second crimping machine at which said wire crimp portions of each set can be crimped onto wires and severed from said carrier strip.

4,242,536

ALUMINUM-STABILIZED MULTIFILAMENTARY SUPERCONDUCTOR

Morris S. Young, Murray Hill, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 737,868, Nov. 1, 1976, Pat. No. 4,148,129.
This application Jan. 17, 1979, Ser. No. 4,138
Int. Cl.³ H01B *12/00*
U.S. Cl. 174—128 S **1 Claim**



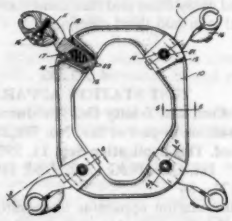
1. A composite superconductor comprising a plurality of superconductive filaments symmetrically dispersed in a matrix of aluminum alloy having substantially the electrical and thermal conductivity and the mechanical properties of an alloy of at least 99.00% Al and 0.05–0.20% Cu, said matrix being in intimate contact with a surrounding stabilizing sheath of aluminum of nominal 99.999% purity.

4,242,537

SPACER DAMPER

David Hearnshaw, Lutterworth, England, assignor to Dulmison (Australia) Pty. Ltd., Australia

Filed May 29, 1979, Ser. No. 43,567
Claims priority, application Australia, Jun. 8, 1978, PD4641
Int. Cl.³ H02G *7/14, 7/12*
U.S. Cl. 174—42 **9 Claims**



1. A spacer damper for transmission line cables comprising:

a substantially planar frame member formed of a rigid one-

piece construction and including means defining a plurality of pivotal connection regions, each pivotal connection region having a recessed portion;

a plurality of clamping arms, each having a distal end and a proximal end, each proximal end extending into an associated one of said frame member recessed portions and having a non-circular recess on each of two opposite surfaces thereof;

a plurality of clamping means, each clamping means attached to the distal end of an associated one of said clamping arms for grasping an individual conductor;

a plurality of one-piece resilient energy absorbing elements, each energy absorbing element having in its quiescent condition a substantially uniform thickness and a shape substantially conforming to the shape of the clamping arm proximal end non-circular recesses, said energy absorbing elements located in the recesses on opposite surfaces of associated ones of said clamping arm proximal ends;

a plurality of end caps positioned over said clamping arm proximal ends and said frame member recessed portions, each end cap provided with a recess for engaging one of said energy absorbing elements;

a plurality of locking bolts and nuts, each locking bolt connected to said frame member and extending through an associated one of said frame member recessed portions, through the associated energy absorbing elements and the proximal end of the associated clamping arm to connect such clamping arm to said frame member with that clamping arm lying substantially in the plane of said frame member, and through an associated one of said end caps and having an associated one of said nuts affixed thereon to rigidly secure said end cap to said frame member straddling the associated recessed portion to lockingly hold the associated energy absorbing elements in compression, providing resistance to turning of the associated clamping arm under torsional displacement of said clamping arm and resiliently pivotally connecting the associated clamping arm to said frame member for resilient hinged part rotation relative to said frame member while substantially preventing longitudinal displacement therebetween

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4,242,538

RADIO CHANNEL CONTROL SYSTEMS OF MOBILE RADIO TELEPHONE SYSTEMS

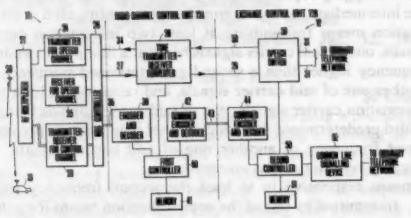
Sadao Ito, Yokohama; Noriaki Yoshikawa, Yokosuka, and Mitsuru Komura, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 801,022, May 26, 1977, abandoned. This application Mar. 7, 1979, Ser. No. 18,368

Claims priority, application Japan, Jun. 28, 1976, 51-76196; Jun. 28, 1976, 51-76197

Int. Cl.³ H04Q *7/00*

U.S. Cl. 179—2 EB **10 Claims**



1. In a mobile radio telephone system for connecting mobile stations to a telephone network of the type wherein the service area of the system is divided into a plurality of radio zones, one of a plurality of base stations is installed in respective radio areas, each of the base stations is connected to said mobile stations through a common control channel frequency and a plurality of speech channels, a control unit connected between an ordinary telephone network and said plurality of base stations, the improvement wherein said control unit comprises a telephone exchange control unit provided with a telephone exchange connector including a speech path switch and a radio channel control unit including a radio channel control system and wherein said radio channel control unit and said telephone exchange control unit includes first and second sequence controllers, respectively, having independent functions, said first sequence controller being responsive to the intensities of signal received by said base stations indicated on said control channel, said signal being transmitted from a transmitting mobile station, and designating an idle speech channel in the base station having received the maximum signal intensity from said mobile station, said second sequence controller being responsive to a speech channel signal received from said mobile station to connect said mobile station signal to a telephone network through a switch controlled by said second sequence controller, whereby information is exchanged among respective base stations through the speech channels and the control channel.

4,242,539

TELEPHONE INFORMATION DISPLAYING DEVICE

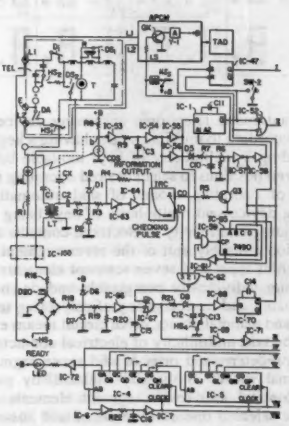
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 794,625, May 6, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,511

Claims priority, application Japan, May 8, 1976, 51-52435

Int. Cl.³ H04M *15/06*

U.S. Cl. 179—5.5 **12 Claims**



7. A display device for displaying a coded signal, comprising:

display means for displaying a telephone number represented by coded signals;

first circuit means operatively associated with said display means (NL, CDS, IC-53, IC-54, IC-1, IC-47, IC-49) for clearing a telephone number displayed on said display means, in response to the arrival of a calling signal or a pulse similar to said calling signal;

second circuit means operatively associated with said display means (LT, IRC, Q3) for receiving and shaping a coded signal representative of the telephone number of a calling party when the hand-set of a telephone set provided with said display device rests on the hook switch of said telephone set, and after checking whether or not said coded signal is correct, applying said coded signal to said display means;

third circuit means operatively associated with said display

means (IC-100, D20-23, IC-66, etc.) for coding a telephone number (of Subscriber-B) which is dialed by a called party (Subscriber-A) into a coded signal, and applying said coded signal to said display means by switching said second circuit means in association with the hook switch of said telephone set; and

means (IC-70) for generating a start pulse in response to a minimum pause which is provided for shifting said coded signal of said calling party or subscriber (Subscriber-B).

4,242,540

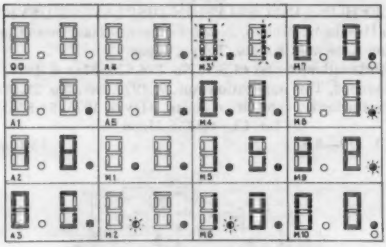
AUTOMATIC TELEPHONE ANSWERING DEVICE INCLUDING A DISPLAY FOR DISPLAYING INDICATIONS OF THE VARIOUS OPERATING MODES OF THE DEVICE

Aldo Franchi, Saronno, and Giuseppe Allerino, Milan, both of Italy, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 18, 1979, Ser. No. 4,436

Int. Cl.³ H04M *1/64*

U.S. Cl. 179—6 R **18 Claims**



1. An automatic telephonic answering device effective to operate according to multiple modes having a keyboard assembly including a multiplicity of keys movable between raised and lowered positions to select desired operating modes of said plurality of operating modes of said automatic telephonic answering device said multiplicity of keys being coupled to a corresponding multiplicity of electrical contacts comprising in combination a display unit of the seven segment element and decimal point type, said seven segment elements and decimal points being individually energizable and de-energizable for the energizing and de-energizing of respective seven segment elements and decimal points, drive circuit means effective to be actuated by said multiplicity of electrical contacts of said keys to cause predetermined ones of said seven segment elements and decimal points to visually indicate, by predetermined combinations of said seven segment elements and decimal points, the selected operating mode of said answering device and reversible electronic counter means effective to trigger said seven segment elements and decimal points to provide a visual indication of the count of the calls received by said automatic answering device.

4,242,541

COMPOSITE TYPE ACOUSTIC TRANSDUCER

Otaro Ando, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,150

Claims priority, application Japan, Dec. 22, 1977, 52/153565; Jan. 5, 1978, 53/24; Jan. 5, 1978, 53/25; Nov. 7, 1978, 53/136942

Int. Cl.³ H04R *23/02*

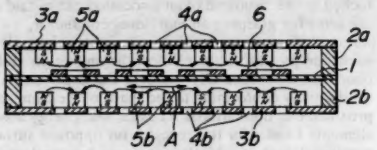
U.S. Cl. 179—110 A **18 Claims**

1. A composite type acoustic transducer of a flat drive type acoustic transducer and of a piezoelectric type acoustic transducer comprising:

a diaphragm including a membrane made of high molecular piezoelectric material, an electrode layer applied on one surface of the membrane and a coil-like conductor applied on the other surface of the membrane;

means for supporting the diaphragm along its edge;

means for forming a magnetic field extending in parallel with the diaphragm and cooperating electromagnetically with the coil-like conductor;



means for supplying an audio signal current through said coil-like conductor; and

means for applying a voltage related to an audio signal to be reproduced across the electrode layer and the coil-like conductor.

4,242,542

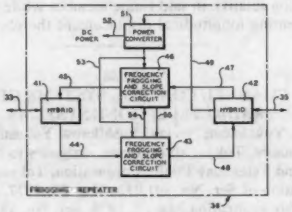
FROGGING SIGNAL REPEATER FOR A TRANSMISSION LINE COMMUNICATIONS SYSTEM

Mahlon D. Kimbrough, Hurst, Tex., assignor to Reliance Telecommunication Electronics Company, Bedford, Tex.

Filed Dec. 4, 1978, Ser. No. 966,100

Int. Cl.³ H04H *1/08*; H04B *3/36, 3/32*

U.S. Cl. 179—170 R **23 Claims**



1. A communication system for transmitting information in both directions over a transmission line including a communication means connected to each end of the transmission line and a frogging repeater means connected to the transmission line intermediate the two communication means, each communication means transmitting at least two information carrier signals, one of said carrier signals being at a first predetermined frequency higher than a second predetermined frequency of another one of said carrier signals, and receiving at least two information carrier signals, one of said carrier signals being at a third predetermined frequency higher than a fourth predetermined frequency of another one of said carrier signals, the frogging repeater means comprising:

means responsive to at least the second frequency signal transmitted by one of the communication means for generating a first coordination reference signal representing the length of the transmission line between the repeater means and the one communication means; and

means responsive to the first and second frequency signals transmitted by the other communication means, a reference signal at a predetermined frequency and said first coordination reference signal for generating the third and fourth frequency signals respectively to the one communication means each at a magnitude whereby the one com-

munication means receives the third and fourth frequency signals at a predetermined magnitude.

4,242,543

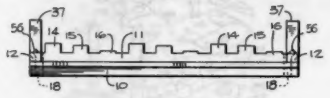
MULTIPLE CANTILEVER SPRING CONTACT HOOK SWITCH

William F. Wernet, Nashville; William J. Adams, Franklin, and Steve W. Haskins, Laverne, all of Tenn., assignors to Northern Telecom, Inc., Ottawa, Canada

Filed Aug. 14, 1979, Ser. No. 66,408

Int. Cl.³ H01H *1/28*

U.S. Cl. 200—1 A **16 Claims**



1. A multiple cantilever spring contact switch comprising:

a base and a top, each having a planar web, the webs spaced apart to define a contact enclosure;

a rim along one edge of each of said base and top, said rims in opposition;

clamping surfaces at said rims;

cantilever spring contact members clamped at one end between said clamping surfaces, said clamping surfaces inclined relative to each other whereby said contact members extend at different inclinations across said enclosure, electrically isolated from each other, said spring contact members and said base and top forming a switch assembly;

contact positions at free ends of said contact members, one of said contact members extended at said free end beyond said enclosure for actuation thereof;

means for connecting an electrical conductor to each contact member; and

a pivotal member pivotally mounted on said switch assembly, said pivotal member including a projecting member having an edge positioned in actuating-relationship to said free ends of said extended contact members, and localized means on said pivotal member for contact with an operating member whereby movement of said operating member pivots said pivotal member to actuate said contact members, actuation of said extended contact members changing contact conditions between said contact members.

4,242,544

MULTIPLE-SWITCH ARRANGEMENT

Hans E. Schweitzer, Wettingen, Switzerland, assignor to H. E. Schweitzer AG, Wettingen, Switzerland

Filed Jan. 11, 1978, Ser. No. 868,688

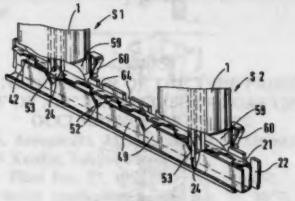
Claims priority, application Switzerland, Jan. 12, 1977, 327/77

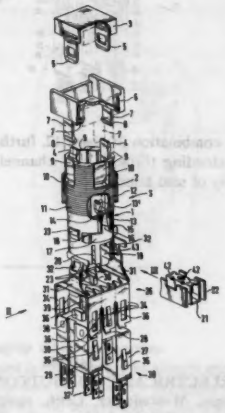
Int. Cl.³ H01H *9/26*

U.S. Cl. 200—5 E **30 Claims**

1. A multiple-switch arrangement, comprising a plurality of discrete mechanical switches each including a housing incorporating the mechanical parts of the respective switch and having first and second end portions, at least one switching element incorporating the electrical parts of the respective switch, and means for separably coupling said switching element directly to the first end portion of the housing, including rapid-release connecting means on said switching element and on said first end portion of said housing and engageable with one another with snap action; and an elongated receptacle extending substantially transversely of said housings an confined between said first end portions of the latter and the respective switching elements, said switches being held in predetermined positions relative to one another on the receptacle exclusively by the confining action of said connecting means.

18. The arrangement of claim **1**, wherein said receptacle includes movable means for blocking simultaneous actuation of switching elements of several switches, each of said switches further including a mobile motion transmitting member in line with said receptacle and said receptacle having openings in register with said motion transmitting members so that a given





motion transmitting member which is caused to penetrate into said receptacle displaces said blocking means whereby the thus displaced blocking means prevent penetration of another motion transmitting member into said receptacle prior to withdrawal of said given motion transmitting member.

4,242,545

MECHANICAL SWITCH

Hans E. Schweitzer, Wettingen, Switzerland, assignor to H. E. Schweitzer AG, Wettingen, Switzerland

Filed Jan. 11, 1978, Ser. No. 868,689

Claims priority, application Switzerland, Jan. 12, 1977, 326/77

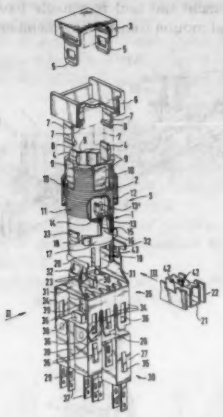
Int. Cl.³ H01H *9/20, 13/50*

U.S. Cl. 200—5 R **21 Claims**

1. In a mechanical switch, particularly in a latching or momentary switch, the combination of an elongated housing including a tubular front end portion having external threads and a plurality of external grooves extending lengthwise of said housing; a frame adjacent to said front end portion and having arms extending lengthwise of said housing and into said grooves; and a nut meshing with said end portion and movable on the latter frontwardly toward a mounting position in which it surrounds said arms and presses the same into said grooves to affix said frame to said housing, and rearwardly toward a releasing position in which said arms are exposed and said frame is separable from said housing.

6. The combination of claim **1**, wherein said housing includes a second end portion and further comprising an adapter, means for separably coupling said adapter to said second end portion,

a plurality of discrete switching elements, and means for separably coupling said switching elements to said adapter.



14. The combination of claim 12, further comprising a control rail extending through said channel and being movable transversely of said housing.

4,242,545

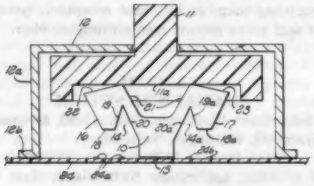
ELECTRICAL PUSH-BUTTON SWITCH

Oscar Alonso, Westminster, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 6, 1978, Ser. No. 957,892

Int. Cl.³ H01H *1/12, 13/52, 15/00*

U.S. Cl. 200—16 A **8 Claims**



1. A push-button switch for use with printed-conductor electronic circuit boards, comprising:

two pairs of spatially separated but generally parallel printed conductors on said circuit board;

a resilient conductive elastomer member having a portion in contact with said circuit board between said two pairs of conductors, said member being shaped, when unstressed, to have a pair of cantilevered upwardly and outwardly, oppositely extending wing portions each positioned over a corresponding pair of said conductors in spaced relationship so as not to produce contact therewith;

and push button means mounted over and separate from said member and movable relative to said wing portions, said push button means applying a compressive force to said wing portions to deflect said wing portions downwardly into contact with said corresponding pairs of conductors.

4,242,547

PERIODICAL SWITCHING DEVICE CAPABLE OF ADJUSTING THE OPERATION TIME

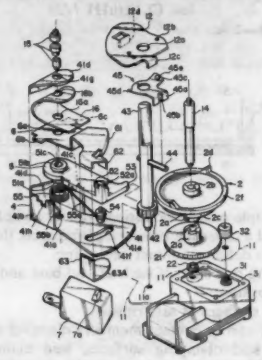
Kazuo Hashimoto, Iida, Japan, assignor to Iida Sankyo Kabushiki Kaisha, Iida, Japan

Filed Aug. 1, 1978, Ser. No. 930,094

Claims priority, application Japan, Aug. 8, 1977, 52-94104; Nov. 26, 1977, 52-141137

Int. Cl.³ H01H *7/00*

U.S. Cl. 200—38 R **15 Claims**



1. A periodical switching device capable of adjusting operation time, comprising;

a switching means for opening and closing an electric circuit;

a cam member which periodically operates being interlocked to a source of driving;

a swinging member for contacting a cam surface of said cam member;

an operation member which rides on and engages said swinging member and disengages from said swinging member according to swinging motion of said swinging member thereby to operate said switching means;

an operation-time adjusting means which adjusts the swinging member relative to said cam surface; and

a mounting member which holds relative positions of said swinging member and said operation-time adjusting means, said swinging member and said operation member, and said operation member and said switching means;

wherein the operation time of said switching means is set by the adjusting means adjusting the position of said swinging member relative to said cam member.

4,242,548

LIMIT SWITCH

Haruo Atsumi, Otsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 20, 1979, Ser. No. 22,301

Claims priority, application Japan, Mar. 31, 1978, 53-38700

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—47 **5 Claims**

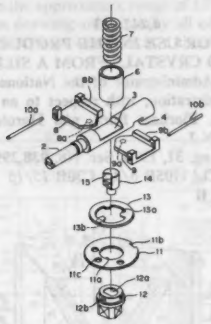
1. A limit switch including a switch component and an acutator for driving said switch component, said actuator comprising:

a casing;

a shaft rotatable about its axis mounted within said casing, said shaft having a lever engaging portion;

a pair of levers pivotably supported under said shaft said levers being in a direction perpendicular to the axis of said rotating shaft, each lever having a free end extending from its pivot point, the free end of each lever opposing the free end of the other lever, the free ends of said levers being selectively engageable with the lever engaging portion of

said shaft such that rotation of said shaft in a first direction causes said shaft engaging portion to press the free end of one of said levers, if engaged therewith, causing its pivotal movement and rotation of said shaft in a second direction causes said shaft engaging portion to press on the free end of the other of said levers, if engaged therewith, causing its pivotal movement; and,



a vertically reciprocal driving plunger having an upper surface which is selectively engageable with a selected one of or both of said levers to control engagement of a selected one of or both of said levers with said lever engaging portion of said shaft, said plunger being vertically moved by the pivotal movement of a lever engaged with said upper surface caused by rotation of said shaft for driving said switch component.

4,242,549

ELECTRICAL GAS-BLAST CIRCUIT BREAKER AND METHOD OF MANUFACTURE

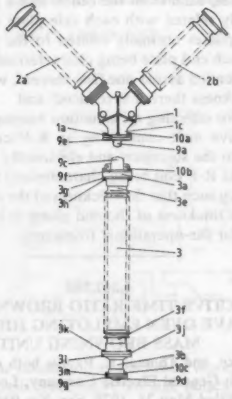
Georg Köppl, Birr; Helmut Nowack, Fislisbach, and Violi Carmelo, Untersiggenthal, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 24, 1979, Ser. No. 6,125

Claims priority, application Switzerland, Jan. 26, 1978, 839/78

Int. Cl.³ H01H *33/00*

U.S. Cl. 200—144 R **18 Claims**



15. A method of assembling a housing assembly for an electrical gas blast circuit breaker, comprising the steps of:

filling a first compartment housing a first switch assembly with a pressurized quenching gas;

filling a second compartment housing a second switch assembly with the pressurized quenching gas;

releasably sealing each of the compartments;

joining the first and second compartments together; and

automatically communicating the first and second compartments when the first and second compartments are joined together.

4,242,550

CIRCUIT INTERRUPTER OF THE TYPE PRODUCING A PUFF OF ARC EXTINGUISHING GAS UPON OCCURRENCE OF AN ARC

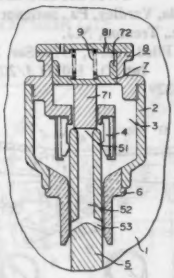
Masami Kii, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,452

Claims priority, application Japan, Jun. 27, 1977, 52/76734; Aug. 30, 1977, 52/104474

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 R **8 Claims**



1. A circuit interrupter which comprises:

a pair of interengaged contacts being relatively movable into a spaced apart position in a fluid for arc extinction;

an arc space formed by the separation of the contacts;

a chamber connected to the arc space to store the fluid for arc extinction pressurized in the arc space;

an outlet for discharging the fluid in the chamber through the arc space out of the chamber after separation of the contacts for a specific distance; and

means for precompressing the fluid for arc extinction in the chamber dependent upon movement of the contacts in a direction for separation thereof.

4,242,551

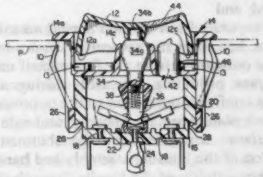
ENVIRONMENTALLY SEALED ROCKER SWITCH

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 945,520, Sep. 25, 1978, abandoned. This application May 17, 1979, Ser. No. 39,859

Int. Cl.³ H01H *9/04, 9/16*

U.S. Cl. 200—302 **10 Claims**



1. An electric switch housing for protecting the fixed contacts and movable contact bridging member from environ-

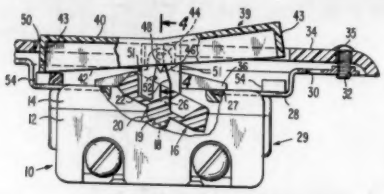
mental conditions external to the switch, said housing comprising an upwardly open dielectric base for said contacts and bridging member, a dielectric cover bracket secured to said base for isolating the contents of the base from the environment, said cover bracket having a recessed portion and a generally cylindrical upstanding boss defined centrally of said recessed portion, an actuator snugly received in a central opening of said boss and having a shoulder portion engaging an inturned lip on said boss, an inner end of the actuator adapted to engage the movable contact bridging member and an upper end of said actuator projecting above the lip of said boss, said cover bracket having a raised peripherally extending wall portion, said wall portion having aligned openings therein, which openings are also aligned with a diameter of the upper portion of said cylindrical boss, and a rocker with laterally projecting tabs pivotally received in said aligned openings and having a center portion for receiving said upwardly projecting end of said actuator.

4,242,552

MOUNTING MEANS FOR INTERCHANGEABLE SWITCH HANDLES

Julius F. Tibolla, Yardley, Pa., assignor to GTE Sylvania Wiring Devices, Inc., Trenton, N.J.

Filed Jan. 8, 1979, Ser. No. 1,496
Int. Cl.³ H01H *3/20, 3/00*
U.S. Cl. 200—339 **9 Claims**



1. In an electrical switch-and-coverplate structure of the type that includes a switch having a housing assembly and an actuator movably supported thereby, and a cover plate removably attached to said assembly and having an opening providing access to the actuator and the housing assembly and having opposite side edges, an improved handle and mounting means therefor comprising:

(a) a switch handle adapted to be disposed within said opening, said handle having opposite sides in close proximity to the respective side edges of the cover plate opening;

(b) means on the housing assembly and handle respectively, providing a separable snap type pivotal connection therebetween for rockably connecting the handle to the housing assembly in position to move the actuator responsive to rocking of the handle by a user, said means being adapted to effect the snap connection of the housing assembly to the handle in response to movement of the handle in a direction rearwardly toward the assembly both with and without the cover plate attached, and the snap disconnection thereof responsive to exertion of a pulling force in the opposite direction with the cover plate removed; and

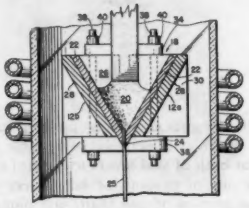
(c) means separate from the first named means and mounted upon the handle at the respective, opposite sides thereof laterally outwardly from the first named means, said second means providing forwardly facing abutments disposed in confronting relation to the opposite side edges of the cover plate opening whereby said side edges constitute surfaces engageable by the abutments to prevent separation of the housing assembly and handle and consequent removability of the handle through the cover plate opening whenever the cover plate is attached to the housing assembly, said second named means leading the first named means in the sense of said movement of the handle in the rearward direction, said second named means arriving at a final position in which the side edges of the cover plate opening are engageable by said abutments of the second named means, prior to relative movement of the first named means on the handle assembly and handle at a final position in which they provide said pivotal connection between the handle assembly and handle.

4,242,553

APPARATUS FOR USE IN THE PRODUCTION OF RIBBON-SHAPED CRYSTALS FROM A SILICON MELT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Samuel Berkman, Florham Park, and Harold E. Temple, Trenton, both of N.J.

Filed Aug. 31, 1978, Ser. No. 938,299
Int. Cl.³ H05B *6/30*; C30B *15/16*
U.S. Cl. 219—10.49 R **4 Claims**



1. In an apparatus for use in the pulling of ribbon-shaped crystals downwardly through a die set defined between a pair of quartz plates disposed in downwardly converging planes for forming an elongated, V-shaped crucible containing an electrical conductive melt, means for coupling induction heating energy to the melt comprising:

A. susceptor supporting said crucible including a pair of susceptor halves having a pair of side plates disposed in mutually spaced opposed relation, each of said side plates being substantially planar in shape and formed of an electrically conductive material, said pair of plates being downwardly inclined toward each other and having an electrically insulative air-gap defined therebetween throughout the length thereof for electrically isolating the side plates, each from the other, and a pair of end plates integrally related with each side plate and disposed in a pair of planes normally related to the plane of the side plate, each end plate being characterized by a plurality of slots extended across one face thereof, whereby the effective thickness thereof is reduced; and

B. means for effecting an induction heating of the electrical conductive melt comprising an R-F coil concentrically related to the susceptor and electrically coupled with the melt, said R-F coil being characterized by an operational frequency such that the thickness of the side plates and the effective thickness of the end plates is less than two skin depths for the operational frequency.

4,242,554

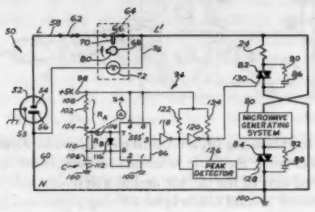
EFFECTIVE TIME RATIO BROWNING IN A MICROWAVE OVEN EMPLOYING HIGH THERMAL MASS BROWNING UNIT

Bohdan Hurko, and Thomas R. Payne, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed May 31, 1978, Ser. No. 911,615
Int. Cl.³ H05B *6/68, 6/72*
U.S. Cl. 219—10.55 B **9 Claims**

1. In a cooking oven having a cooking cavity, an electrical resistance food browning system positioned within the cavity

so as to brown by radiant energy the surface of food being cooked therein, a microwave energy generating system supplying the cooking cavity, and a means for establishing the overall duration of a cooking operation, the oven adapted for operation from an electric power source insufficient to supply both the food browning system and the microwave energy generating system simultaneously, and the food browning system having a relatively high thermal mass such that its heat up rate is within the approximate range of 13° F./second to 26° F./second when drawing substantially all of the power available from the electric power source, a time ratio control system comprising:



power control means responsive to said means for establishing the overall time duration of a cooking operation for alternately energizing said microwave energy generating system and said electrical resistance food browning system, each cooking operation having a plurality of energization intervals of said microwave energy generating system and a plurality of effective browning intervals during which said electrical resistance food browning system is energized, and each effective browning interval having at least a predetermined minimum duration of at least thirty seconds selected to allow said browning system time to reach at least a minimum effective temperature.

4,242,555

PROCESS AND APPARATUS FOR ELIMINATING SHORT CIRCUITS IN ELECTRICAL DISCHARGE MACHINING

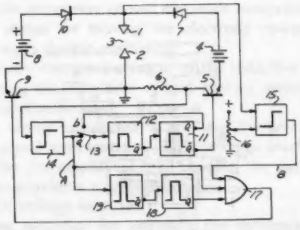
Roger Delpretti, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Feb. 16, 1978, Ser. No. 878,567

Claims priority, application Switzerland, Feb. 23, 1977, 2251/77

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 M **7 Claims**



1. In a process for machining an electrode workpiece by an electrode tool wherein consecutive voltage pulses are applied across said electrodes for causing current pulses of a predetermined intensity to flow thereacross, comprising monitoring the machining conditions in the machining gap between the electrodes and increasing the current pulse intensity when such monitoring indicates the presence of a short circuit bridging the gap, the improvement comprising increasing the intensity level of said current pulse after a first predetermined time interval delay from the beginning of said current pulse, interrupting the increased intensity level of said current pulse after a second predetermined time interval delay following said first time interval delay, monitoring the machining conditions during said second time interval delay and reestablishing current pulses of normal intensity as soon as such monitoring indicates the disappearance of said short circuit.

4,242,556

GUIDING AND STRESSING AN ELONGATED, STRETCHED, RENEWABLE ELECTRODE IN ELECTRO-EROSIVE MACHINING

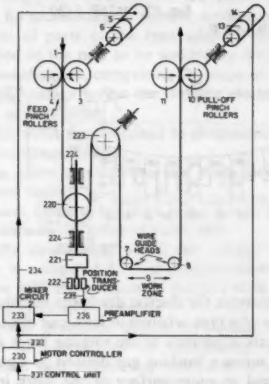
Werner Ullmann, Locarno; Bernd Schumacher, Losone; Herbert Ruh, and Beat Kilcher, both of Ascona, all of Switzerland, assignors to A.G. für Industrielle Elektronik AGIE, Losone b. Locarno, Switzerland

Continuation of Ser. No. 731,783, Oct. 12, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 896,141

Claims priority, application Switzerland, Nov. 10, 1975, 14514/75

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 W **6 Claims**



1. In combination with an electrical discharge machine an apparatus for pulling a wire with a predetermined speed and tension through a work zone, comprising

wire feeding means which feed the wire at a controlled rate into a wire path from one end of the path, including a pair of feed pinch roller means, of which at least one is driven;

wire take-up means which take up the wire at the other end of the wire path at a controlled, substantially constant rate which is higher than the feeding rate of said feed pinch roller means, including a pair of take-up pinch roller means, of which at least one is driven,

the wire path being a low-friction path and including the work zone along a segment thereof in which the wire is utilized to perform electrical discharge machining function;

static wire stressing means located between said feeding means and the work zone, said stressing means determining substantially the entire tension of the wire in the work zone and comprising a fixed, upper pulley and a movable lower pulley located between said feeding pinch roller means and the working zone, whereby tension in the wire will have the tendency to pull the lower pulley towards the upper fixed pulley, the wire being looped about both of said pulleys, and a tension force applying means connected to said movable lower pulley acting in a direction counter the direction of pull exerted by said wire on the movable pulley to provide a predetermined tensioning

force for the wire to thereby determine substantially the entire tension of the wire in the working zone,

the position of said movable pulley changing with respect to said fixed, upper pulley upon change in elongation of said wire between the feed pinch roller means and the take-up pinch roller means;

means measuring the deflection of said movable pulley upon changes in elongation of the wire and providing a wire path length signal;

and feed control means which receive the wire path length signal and control the feeding rate of said feeding pinch roller means to null said deflection and thus maintain a time-averaged constant length of wire between said feed pinch roller means and said take-up pinch roller means.

4,242,557

APPARATUS FOR ELECTRICAL DISCHARGE MACHINING OF CYLINDRICAL WORK

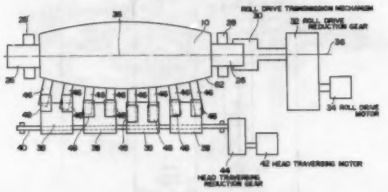
Kunihiko Sato, Owari-Asahi; Tetsuro Urata, Nagoya; Mitsugi Kawano; Terumasa Jinba, both of Fukuyama; Yukio Kato, Kasugai, and Takeo Uebayashi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,405

Claims priority, application Japan, Sep. 30, 1977, 52/116615

Int. Cl.³ B23P *1/20*

U.S. Cl. 219—69 E **7 Claims**


ROLL DRIVE TRANSMISSION MECHANISM
32 ROLL DRIVE REDUCTION GEAR
34 ROLL DRIVE MOTOR
42 HEAD TRAVERSING MOTOR
44 HEAD TRAVERSING REDUCTION GEAR

1. An apparatus for electric discharge machining of a work in roll form of a type wherein at least one electrode is moved along the axis of rotation of the rotating work and discharges are caused across a working gap defined by a gap between the electrode and an outer surface of the work in roll form to thereby give a satin finish of a desired worked roll surface roughness to the outer surface of the work, said apparatus comprising:

a plurality of electrode heads divided and arranged at predetermined spaces along the axis of rotation of the work in roll form;

at least one rectangular electrode retractably and adjustably mounted on each of said plurality of electrode heads, each said electrode having a flat discharge surface;

electrode gap adjusting means provided on each of said electrode heads for continuously biasing said at least one rectangular electrode against and into contact with said outer surface of said work in roll form in correspondence to said desired worked roll surface roughness; and

electrode traversing means for traversely feeding each said electrode head a predetermined distance along the axis of rotation of said work;

wherein each said electrode head has a guide slot formed therein, said at least one rectangular electrode being received in said guide slot, said electrode gap adjusting means including spring means disposed in said guide slot for supporting said at least one rectangular electrode, and clamping means for securing said at least one rectangular electrode to said electrode head in such a position that said at least one rectangular electrode is biased by said spring means and projected against and into contact with said outer surface of said work by said spring means.

4,242,558

DEVICE FOR BREAKING OFF THE WIRE-LIKE OR STRIP-LIKE ELECTRODE IN AN ELECTRO-EROSION MACHINE

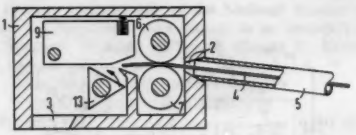
Karl Kunze, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,176

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755740

Int. Cl.³ B23P *1/00*

U.S. Cl. 219—69 W **7 Claims**



1. A device for breaking off a wire-like or strip-like electrode for an electro-erosion machine wherein the electrode is supplied from a feed side of the device and at a delivery side of the device is deposited behind a workpiece being processed by the electro-erosion machine, comprising: feed roller means having drive rollers at the delivery side for advancing the electrode; an anvil following the feed roller means; a rotatable bit means having a grooving edge and which is adjacent a surface of the anvil; said feed roller means inserting the electrode into a gap between the surface of the anvil and the rotatable means; the rotating bit means grooving the electrode on the anvil surface; the anvil being deflectable and means being provided for biasing a surface of the anvil towards the bit means to cooperate with the bit means for said grooving so as to prevent cutting completely through the grooved electrode at the groove by the bit means; and a peripheral speed of the grooving edge being greater than a peripheral speed of the drive rollers of the feed roller means so as to cause a grooved piece of the electrode to be torn off at the grooves and jump away.

4,242,559

METHOD AND APPARATUS FOR THE ELECTRO-EROSIVE MACHINING OF WORKPIECES WITH AUTOMATIC THREADING OF THE ELECTRODE

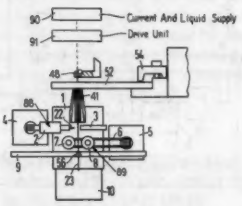
Hans Roemer, and Klaus-Peter Steil, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,220

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755777

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 W **21 Claims**



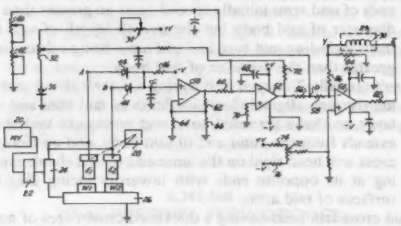
1. A method for the electro-erosive treatment of workpieces with wire-like and strip-like electrodes wherein the path of relative movements between the workpiece and the electrode is controlled by means of an electronic control system, and wherein the wire-like or strip-like electrode is guided by guide means on a feed side of the workpiece and fed by a clamp and

feed device means into a starting bore of a contour which is to be provided in the workpiece, and wherein the electrode is thrust through the starting bore by the clamp and feed device means until the electrode is brought into an active connection with a drive means at a delivery side of the workpiece by use of a gripper means, comprising the steps of: stopping the drive means when an end point of a contour is reached and clamping the electrode only on the feed side by actuating the clamp and feed device means to clamp the electrode at a clamping point on the feed side of the workpiece only; grooving the electrode with a grooving device comprising an anvil surface and cooperating grooving edge between the clamping point and the workpiece; starting the drive means and during forwards movement of the electrode the electrode is broken off by pulling at the groove and simultaneously stretched to become stiffer; positioning a starting bore for a next contour to be eroded by means of the electronic control system; threading the end of the electrode into the new starting bore and advancing it beyond the workpiece to a distance which has been established prior to the processing by use of the clamp and feed device means; gripping the end of the electrode with the gripper means and supplying it to the drive means; and when the end of the electrode has been gripped by the drive means a processing of the workpiece in the new contour is continued.

4,242,560
SERVO FEED SYSTEM FOR AN ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Davey J. Chance, Concord, all of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,630
Int. Cl.³ B23P 1/12
U.S. Cl. 219—69 G **7 Claims**



1. In an electrical discharge machining apparatus for machining an electrically conductive workpiece by an electrode across a dielectric coolant filled gap, a servo feed circuit for controlling the movement of said electrode comprising:

a motive means for moving the electrode upwardly and downwardly during machining;

an electrically energized element of the inductive type for controlling the operation of said motive means and its direction of movement;

a sensing circuit connected to the gap for providing an output signal representative of gap voltage level;

an amplifier for amplifying and clipping the gap voltage signal to provide a modified signal;

a reference voltage source;

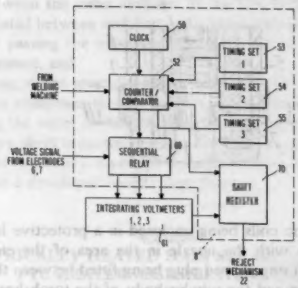
a summing amplifier for summing the reference voltage signal and the modified gap voltage signal; and

a power amplifier receiving its input from the summing amplifier to its input terminal and having its output terminal operably connected to one terminal of said electrically energized element and having its input terminal operably connected to the other terminal of said electrically energized element for providing current feedback through said electrically energized element.

4,242,561
ELECTRIC SEAM WELD MONITORING APPARATUS AND METHOD

George Long, Philadelphia, Pa., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Feb. 7, 1979, Ser. No. 10,029
Int. Cl.³ B23K 11/00
U.S. Cl. 219—109 **5 Claims**



1. A method for monitoring an electric welding process for welding a series of parts of the type wherein the welding current is applied to the part to be welded by welding electrodes as a series of pulses, comprising the steps of:

integrating the voltage across the welding electrodes over the length of each pulse;

comparing the value thus obtained to predetermined maximum and minimum limits;

producing an alarm signal when said value does not fall between said limits;

using said alarm signal to trigger a reject means for removing the part from the series of parts; and

controlling the time during which the voltage across the electrodes is compared to said predetermined limits in accordance with the position of the part with respect to the welding electrodes, wherein

a blanking pulse generator directs the voltage across the electrodes to a plurality of integrating voltmeters, wherein each said integrating voltmeter is adapted to generate an alarm signal if said voltage does not fall within the predetermined limits, and wherein said blanking pulse generator directs the voltage to the particular integrating voltmeter corresponding to the stage in the welding process at which the voltage across the electrodes is measured.

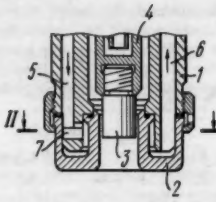
4,242,562
PLASMA ARC TORCH HEAD

Viktor N. Karinsky, Odintsovo, bulvar Novoselovoi, 10, kv. 43, Moskovskaya oblast; Ivan A. Kuznetsov, Yarzevskaya ulitsa, 31, korpus 5, kv. 8, Moscow, and Viktor I. Kutsyn, Ruzsky raion, poselok Dorokhovo, Zheleznodorozhny proezd, 17, Moskovskaya oblast, all of U.S.S.R.

Filed Aug. 2, 1978, Ser. No. 930,216
Int. Cl.³ B23K 9/00
U.S. Cl. 219—121 P **7 Claims**

1. A plasma arc torch head comprising a hollow tubular body through the interior of which passes a flow of plasma-forming gas and wherein are coaxially arranged an electrode holder and an electrode having its free end surrounded by a cooled nozzle formed with double walls connected at the end thereof by means of a solid bridging member and forming the end face of the torch head, with the body of the torch head being formed with coolant inlet and exhaust ducts which are oriented so as to enable the flow of the incoming coolant to be directed normally to the cooled portions of the nozzle surface subject to maximum heating in the process of generation of a

plasma jet, said inlet and exhaust ducts being alternatively disposed in an annular ring about said electrode holder and electrode, with radially directed passages situated adjacent the solid bridging member for communicating each inlet duct to an adjacent exhaust duct, and wherein electromagnetic coils are mounted concentrically externally of the nozzle to thereby enable control of the plasma jet at the outlet of the torch, said



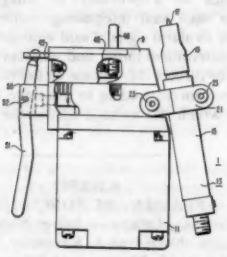
electromagnetic coils being enclosed in a protective housing flush-mounted with the nozzle in the area of the end face thereof, with a ring-shaped plug being fitted between the protective housing and the tubular body of the torch head, said coolant inlet ducts extending over the entire length of the electromagnetic coils and normally to said bridging member between the two walls of the nozzle.

4,242,563

AUTOMATIC PLUG WELDING APPARATUS

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1978, Ser. No. 917,837
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—125.11 **3 Claims**



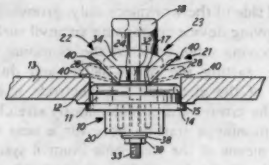
1. Welding apparatus for welding a tapered plug, which can be driven into holding engagement with a cylindrical opening, to the juncture of said opening and plug, said apparatus comprising a spindle detachably connectable and axially alignable with a plug; drive means detachably connected to said spindle in such a manner that the drive means rotates itself about said spindle; said spindle having a circumferential groove and said drive means having a plate slidably disposed therein and biased to engage the groove in the spindle to retain the spindle in the drive means and having means for sliding the plate out of engagement with the groove so that the drive means can be removed from the spindle; and welding means attached to said drive means for producing a weld circumscribing the juncture of said plug and said cylindrical opening.

4,242,564

FROST PLUG IMMERSION HEATER AND IMPROVED CLAMPING STRUCTURE

Willard E. Kendall, Nashville, Tenn., assignor to Budd Canada Inc., Kitchener, Canada

Filed Nov. 1, 1978, Ser. No. 956,639
Int. Cl.³ H05B *3/02*; F02N *17/06*
U.S. Cl. 219—208 **3 Claims**



1. A frost plug immersion heater for liquid cooled engines and comprising a substantially cylindrical body having inner and outer ends, said body being of a size to closely fit into a frost plug hole of an engine block wall and having a lateral flange on its outer end engageable with the engine block wall to limit the movement of the body into the hole, a sealing gasket around the peripheral surface of said body for sealing the gap between the body and the surface of the frost plug hole, an electrical heater element extending from said inner end of said body and having means at the outer end of said body for operative connection to a source of electrical energy, and clamping structure for securing said heater in a frost plug hole in an engine block wall, said clamping structure comprising:

an elongate clamp element having a base engageable against said inner end of said body and a pair of integral arms extending in splayed relation in alignment with each other bendably from opposite sides of said base, with the free ends of said arms initially spaced apart no greater than the diameter of said body but the overall length of said element including said base and said arms being substantially greater than the diameter of said body;

a substantially T-shaped bolt having a central shank extending through aligned clearance holes in said base and said body, so that a threaded outer end portion of said shank extends from the outer end of said body, and an elongate cross arm head rigid on the inner end of said shank engaging at its opposite ends with inwardly facing diagonal surfaces of said arms;

said cross arm head having a thickened crown area of maximum mass providing a maximum strength portion aligned with said shank, the top of said cross arm tapering with diminished mass toward each opposite end to provide truss-like reinforcement for the cross arm head when force is applied through said central shank; a nut threaded on said threaded outer end portion of said shank and thrustingly opposing said outer end of said body;

and a sealing ring between said nut and said body for sealing the outer end of the hole in said body;

said base being substantially flat and engaging a substantially flat area on said inner end of said body about said clearance hole in said body;

said arms being intergrally attached to said base along bend lines enabling the arms to bend towards said inner end of said body and toward the block wall by thrusting action of said cross arm head against said arms, and being of substantially rigid channel-shape and substantially narrower than said base and having longitudinally extending spaced side flanges which project generally inwardly;

said cross arm head being of generally elongate solid bar shape fitting between said flanges in the channels of said arms;

whereby said body with said clamp element and said bolt assembled therewith can be inserted straight into said frost plug hole until said lateral flange on the outer end of said

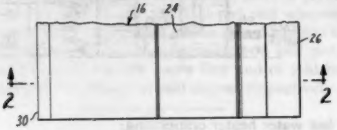
body engages an outer side of the engine block wall about said frost plug hole, and then by tightening said nut said cross arm head is drawn toward said inner end of said body and causes said arms to be bent toward said inner end of said body and thereby into engagement with an inner side of said block wall about said frost plug opening to clampingly secure said body in said frost plug opening.

4,242,565

THERMAL PRINT HEAD

David J. Schoon, Marine, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 5, 1979, Ser. No. 45,821
Int. Cl.³ H05B *1/00*
U.S. Cl. 219—216 **11 Claims**



1. A thermal print head including:

a plurality of spaced-apart electrical conductors each having a terminated end portion, each of said end portions having a surface area;

an electrically and thermally insulating support structure carrying said electrical conductors, said support structure having a surface portion adjacent each of said surface areas of the electrical conductors;

a common electrical conductor having a portion for each of said surface areas of the electrical conductors that is spaced from and essentially parallel to said surface areas of the electrical conductors; and

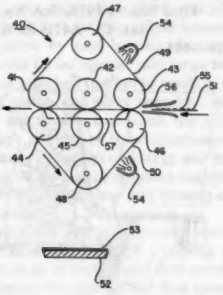
resistive heating material extending between and in electrical contact with said common electrical conductor and each of said surface areas of the electrical conductors whereby the application of an electrical voltage between any one of said plurality of electrical conductors and said common conductor causes electric current and most of the resulting thermal energy to flow between said surface area of said one of said plurality of electrical conductors and said portion of said common conductor in a direction essentially perpendicular to said surface area and via said resistive material extending therebetween.

4,242,566

HEAT-PRESSURE FUSING DEVICE

Albert W. Scribner, Darien, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 21, 1980, Ser. No. 132,458
Int. Cl.³ H05B *1/00*; G03G *15/20*
U.S. Cl. 219—216 **18 Claims**



1. A fusing apparatus for applying heat and pressure to a copy sheet to fix a developed toner image thereon, comprising:

a pair of first and second oppositely driven pressure fixing feed rollers, each of the outer surfaces of the rollers comprising a layer of a thermal insulating material;

first and second idler rollers;

A first flexible endless belt disposed about said first idler roller and said first pressure feed roller, and a second flexible endless belt disposed about said second idler roller and said second pressure feed roller, at least one of the belts having an outer surface formed of a thermal conductive material, wherein there is defined an area of contact between the outer surfaces of the first and second belts located between said first and second pressure feed rollers for passing the copy sheet between the two belts under pressure, and

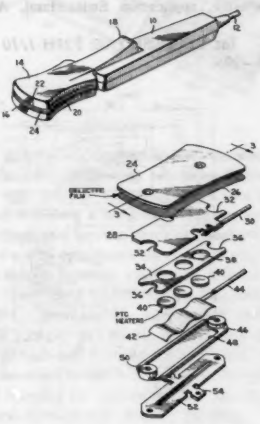
heating means spaced relative to the belt whose outer surface comprises the thermal conductive material for heating the outer surface thereof, whereby when an unfused copy sheet is passed through the area of contact between said two belts it is subject to sufficient heat and pressure to fuse a developed toner image thereon.

4,242,567

ELECTRICALLY HEATED HAIR STRAIGHTENER AND PTC HEATER ASSEMBLY THEREFOR

Robert A. Carter, Asheboro, N.C., assignor to General Electric Company, New York, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,370
Int. Cl.³ A45D *1/02*; H05B *3/12*; H01C *1/148*
U.S. Cl. 219—225 **4 Claims**



1. A heated hair straightener including a handle having power supply means for connection to an electric source, a pair of facing clamp housings pivoted on said handle for a cooperative scissors action therebetween, the housings each having a coverplate facing the coverplate of the other housing for abutment and clamping of hair therebetween and a heater component subassembly in at least one housing for heating the coverplate thereof, said heater component subassembly comprising a sandwich arrangement of

the coverplate of said housing,

a metallic heater plate forming a first electrode connected to one side of said power supply means,

said heater plate overlying said coverplate and comprising a flat elongated plate covering a substantial portion of said coverplate,

a thin dielectric film between said heater plate and said coverplate for insulating said heater plate therefrom,

PTC heater means comprising multiple spaced pellets each having opposed terminal means and aligned on said heater

plate with one of the terminal means of each pellet in electrical contact therewith,

a second electrode formed as a corrugated spring plate having one side covering and electrically contacting the other terminal means of each pellet, said spring plate being connected to the other side of said power supply means,

an electrically insulating locator panel substantially coextensive with said heater plate and provided with cutouts surrounding and locating said pellets between said heater plate and spring plate,

an electrical insulator member abutting the other side of said spring plate,

means aligning said PTC heater means, electrodes, and member in fixed assembled relation to one another, and means fastening together the parts comprising said heater component subassembly with said electrodes compressed against the terminal means of said pellets, and means adjacent said member securing said heater component subassembly in said housing.

4,242,568

APPARATUS FOR THE SELECTIVE PRODUCTION OF HOT WATER AND STEAM

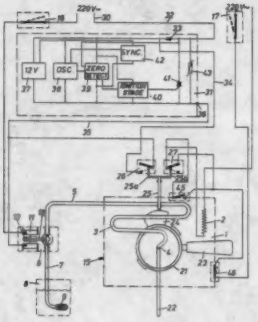
Max Wunderlin, and Peter Gurtner, both of Jona, Switzerland, assignors to Turmix AG, Jona, Switzerland

Filed Apr. 6, 1979, Ser. No. 27,751

Claims priority, application Switzerland, Apr. 10, 1978, 3810/78

Int. Cl.³ H05B *1/00*; F24H *1/10*

U.S. Cl. 219—296 **7 Claims**



1. An apparatus comprising a constantly operating electric heater and reciprocating water feed pump for intermittently supplying said heater with a volume of water through a liquid conduit for the selective production of hot water and steam, said pump being actuatable by an electromechanical driving means, the latter and said heater being operatively connected with an electric current supply for operation of said pump at a first rate of pumping frequency and said heater at a first level of temperature for the production of hot water at a first operation condition, control means connected with said electric current supply for establishing a second rate of pumping frequency at said pump less than said first rate and a second level of temperature at said heater greater than said first level for the production of steam at a second operating condition, with the pump having the same discharge volume per stroke of the pump at the first and the second operating condition, said means including switching means for switching between said operating conditions, and means for actuating said switching means for switching between said first and second operating conditions.

4,242,569

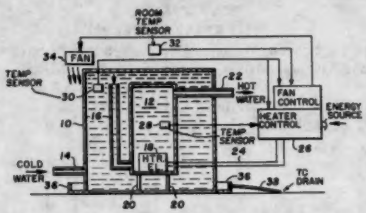
MULTIPLE TANK ELECTRIC WATER HEATER

William M. Kayser, 6408-81st Ave. N., Minneapolis, Minn. 55445

Filed Apr. 24, 1978, Ser. No. 899,472

Int. Cl.³ H05B *1/02*; F24H *1/20*

U.S. Cl. 219—314 **6 Claims**



1. A hot water heater comprising:

a first tank for holding water and having a first inlet;

a second innermost tank within the first tank for holding water and having a second inlet for receiving water from the first tank and having a hot water outlet for supplying hot water from within the second innermost tank to a point of utilization outside of the hot water heater;

heating means located within the second innermost tank for heating the water within the second innermost tank;

first temperature sensing means for sensing temperature of the water within the first tank;

second temperature sensing means for sensing temperature of the water within the second tank;

fan means for directing ambient room air against an outer wall of the first tank;

third temperature sensing means for sensing ambient temperature of the room air outside of the first tank;

control means for controlling the heating means as a function of the temperature differential between the temperatures sensed by the first and second temperature sensing means, and for controlling the operation of the fan means as a function of the differential between the temperatures sensed by the first and third temperature sensing means; and

means for collecting and disposing of water condensed on the outer wall of the first tank.

4,242,570

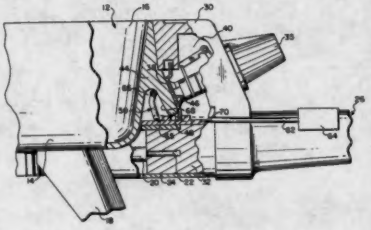
ELECTRIC SKILLET HAVING REMOVABLY ATTACHABLE HANDLE

Robert H. Clark, Columbia, Mo., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 8, 1978, Ser. No. 935,583

Int. Cl.³ A47B *95/02*

U.S. Cl. 219—441 **9 Claims**



1. A skillet or the like cooking vessel including a pan into

which foods to be cooked are placed, an insulative handle for lifting said pan, said pan and said handle including complementarily engageable means for joining said handle to said pan, said locking arrangement including in combination;

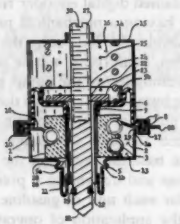
a bracket provided on said pan and a torsion spring mounted on said handle, said torsion spring being movable to a first, locked position whereby a first end thereof engages said bracket subsequent to joining said handle and said pan, and the opposite end of said torsion spring is simultaneously moved to a position whereby said spring is twisted to urge said first end thereof into forcible engagement with said bracket, thereby securing said handle to said pan, said spring being moveable to a second, released position whereby said spring is in a relaxed condition with said first end of said spring being disengaged from said bracket to unlock said pan and handle, thereby permitting disjoinder of said handle and said pan and wherein said complementarily engageable means of said pan and insulative handle includes a sleeve provided on said pan adjacent said bracket portion and a first end of said handle, dimensioned for receipt in said sleeve, respectively.

4,242,571

ELECTRO-THERMAL LINEAR PULL ACTUATOR

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Jan. 29, 1979, Ser. No. 7,048
Int. Cl.³ H05B *3/80*
U.S. Cl. 219—513 **9 Claims**



1. An electro-thermal pull type actuator comprising:

a housing shell including a first flange and also a first open mouth end closed and secured by a first large size rolling membrane centrally receiving an integrally secured axially movable piston and tube assembly of which a first piston is abutting said membrane externally thereto while said tube extending inwardly enters said shell internally to proceed centrally therethrough toward a second shell end wherein it is secured permanently to said shell by a second small size rolling membrane thereby insuring sealed shell proper inside of which an electrical heating element is disposed centrally over said tube with electrical leads to the outside sealed and also a working fluid housed therein subject to vaporization by said heating element for the development of a end thrust against said large membrane with said first piston attached thereto to result in said axial movement of said piston and tube assembly, when said heating element is electrically energized, the direction of movement being upward due to large membrane surface, a biasing force means external to said large size membrane to counter said end thrust and to maintain said piston in a first normally down position, when said heating element is not energized electrically,

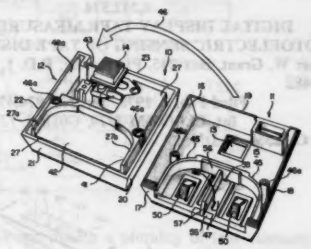
a shell cap with a recessed cavity over said biasing force means and a second flange thereof covering said first flange of said shell so as to secure said first membrane by the edges sealed, means for sealing said first membrane to said centrally passing tube of said piston and tube assembly, including sealing said second membrane, a pull rod assembly including a second piston thereof inside said cavity of said cap abutting said first piston and maintained therein by a spring of said biasing force means while said rod passing inside said tube of said piston and tube assembly protrudes said second shell end, normally exerting a down force when said actuator is secured to a work piece until an opposing force of said end thrust inside said shell moves said piston from a first normally down position to a second upward position thereby urging both pistons to move from a first to a second positions against said biasing force means with subsequent withdrawal of said protruding rod end comprising a pull type actuator means for remote actuation of various mechanisms.

4,242,572

CONTACT LENS DISINFECTOR UNIT

Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Jun. 22, 1979, Ser. No. 51,104
Int. Cl.³ H05B *3/06*; A61L *2/00*
U.S. Cl. 219—521 **7 Claims**



1. A unit for disinfecting contact lenses contained within a relatively flat lens case comprising: a housing having a lateral opening in one side thereof, a heating block disposed within said housing and including a horizontal support surface and a vertical wall surface, said heating block and said housing cooperating to define a lens case receiving compartment, with said lateral opening in said housing leading to said compartment and permitting the sliding insertion of a lens case into said compartment for disposition on said heater block support surface with said vertical wall surface providing a stop for said case as well as an end wall for said compartment, and ejector means slidably mounted to said housing and operable from the exterior of said housing for pushing a lens case outwardly of said compartment through said housing opening.

4,242,573

WATER IMMERSIBLE HEATER

Neville S. Batliwalla, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 24, 1979, Ser. No. 6,188
Int. Cl.³ H05B *3/34*
U.S. Cl. 219—528 **8 Claims**

1. A flexible, electrically conductive, temperature self-limiting heater suitable for immersion in water comprising:

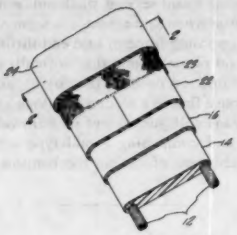
(a) two spaced apart metallic electrodes;

(b) an electrically conductive polymeric composition interconnecting the electrodes;

(c) an electrically insulating prejacket around the polymeric composition;

(d) a flexible, corrosion resistant, electrically non-conductive, water impermeable barrier around the insulating prejacket, the barrier comprising an inner sheet of polyes-

ter film, a flat strip of aluminum, and an outer sheet of polyester film;



(e) an electrically conductive grounding braid around the barrier; and

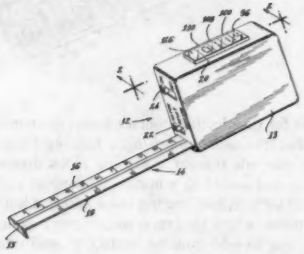
(f) an electrically insulating polymeric outer jacket.

4,242,574

DIGITAL DISPLAY TAPE MEASURE WITH PHOTOELECTRIC SENSING OF TAPE DISPLACEMENT

Walter W. Grant, Box 245, Pierson Dr. R.D. 1, Shelburne, Vt. 05482

Filed Feb. 2, 1978, Ser. No. 874,473
Int. Cl.[3] G06M *3/14*; G01B *3/12*
U.S. Cl. 235—92 DN **10 Claims**



1. A tape measure device for providing a digital readout corresponding to the actual cumulative extension of a tape, said tape measure device comprising:

a housing,

a flexible tape having an end thereof with two measuring scales extending along the length of said tape from said end in English units and metric units, respectively, with respective legible numbers printed on the tape along the respective scales for indicating the length along said tape from said end in English and metric units,

means for winding said tape into a coil in said housing when the tape is retracted into the housing,

two sets of optically sensed encoded markings extending along the tape, each set of markings corresponding to a respective one of said scales,

a light source in said housing for illuminating said sets of encoded markings on said tape as it is being extended from or retracted into said housing,

light detector means in said housing and adjacent said tape for detecting an illuminated set of markings as they pass the light detector means during extension or retraction of said tape,

manually operable control means for selectively shifting said light detector means for detecting one or the other of said set of markings,

electronic logic means responsive to the detected markings for providing an electronic count proportion to actual, net longitudinal extension of said tape from said housing, and

a digital display for providing a display in response to said electronic count corresponding to the actual net extension of said tape from said housing,

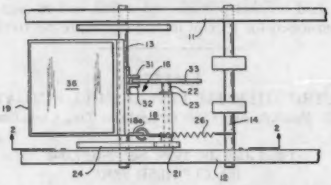
thereby providing a display of actual net extension of said tape from said housing in English or metric units.

4,242,575

GASOLINE PUMP DIGITAL PRICE ENCODER

John A. Callahan, Houston, and Allan S. Ottenstein, Spring, both of Tex., assignors to RF Products Corp., Houston, Tex.

Division of Ser. No. 724,172, Sep. 17, 1976, Pat. No. 4,100,400.
This application Feb. 7, 1978, Ser. No. 875,761
Int. Cl.[3] G06M *1/272*; B67D *5/22*
U.S. Cl. 235—92 FL **3 Claims**



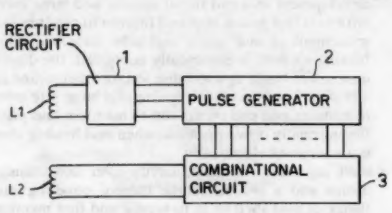
1. A self-contained digital encoder removably mounted in a gasoline pump having a mechanical price computer with an analog output display for indicating the cost of gasoline delivered to the pump, comprising: a base removably mounted on the mechanical computer of the pump, pulse generating means mounted on the base and coupled to the mechanical computer for delivering pulses at a predetermined rate realtive to the flow of gasoline through the pump, pulse divider means mounted on the base for receiving the pulses from the pulse generating means and delivering a predetermined number of output pulses for each unit of gasoline delivered, and means responsive to the application of operating power to the encoder for resetting the pulse divider means to an initial level when the mechanical computer is reset at the outset of each delivery of gasoline, said base, said pulse generating means, said pulse divider means and said means for resetting the pulse divider means forming an integral unit which is readily mounted on and removed from the pump as a unit.

4,242,576

ELECTRONIC IDENTIFICATION DEVICE

Sten T. Lundgren, Akarp, Sweden, assignor to ID-Select Bo Thelin Och Co., Sweden

Filed Dec. 5, 1977, Ser. No. 857,428
Claims priority, application Sweden, Dec. 14, 1976, 7614043
Int. Cl.[2] G06K *7/00*; H04Q *1/30*; G06K *7/04*
U.S. Cl. 235—435 **9 Claims**



1. An identification device for generating a train of pulses, each of said pulses having a respective first or second polarity according to a code identifying said device, responsive to a

single input signal applied thereto, said input signal having a predetermined duration, said device comprising:

(A) a pulse generating circuit having a trigger input and two outputs and being capable of generating a train of pulses responsive to a single trigger signal applied to said trigger input, each of the pulses in said train of pulses being applied to one of said outputs, the particular one of said outputs to which each respective one of said pulses is applied being determined by said code;

(B) a rectifier circuit for both supplying power to said device and for applying said trigger signal to said trigger input responsive to said single input signal, said rectifier circuit comprising

(1) a first diode coupled in series with a first capacitor, said first capacitor being coupled to said trigger input;

(2) a second diode coupled in series with a second capacitor, said second capacitor having a considerably greater capacitance than said first capacitor and being coupled to a power supply input of said pulse generator circuit; and

(3) a first inductive means inductively receiving said input signal and applying said input signal to said first and second capacitors whereby said first capacitor serves as a trigger signal source and said second capacitor serves as a power source; and

(C) inductive means coupled to said two outputs of said pulse generator circuit for inductively transferring said pulses to a detector circuit.

4,242,577

CIRCUIT BREAKER HAVING INSULATION BARRIER

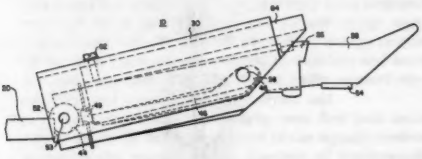
Alfred E. Maier, and Louis N. Ricci, both of Chippewa Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,765

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.³ H01H *73/00*

U.S. Cl. 200—153 G **5 Claims**



1. A circuit breaker comprising:

a plurality of stationary contacts;

a plurality of movable contacts operable between open and closed positions with respect to said stationary contacts;

means for effecting movement of said movable contacts between said open and closed positions, said movement effecting means comprising a toggle means including a pair of aligned first link elements spaced apart from each other and each having a slot therein, and

means for electrically insulating said movable contacts from said movement effecting means, comprising:

at least three electrically insulating contact holders secured to, and holding said movable contacts;

a cross arm extending to, and attached to, said contact holders, said first link elements being disposed intermediate said contact holders with said cross arm being disposed within said first link element slots; and

an insulating barrier disposed intermediate said contact holders and said movement effecting means, said insulating barrier having a pair of openings therein;

said first link elements extending through said insulating barrier openings and operationally engaging said cross arm.

4,242,578

OPTO-ELECTRONIC ANTENNA SYSTEM

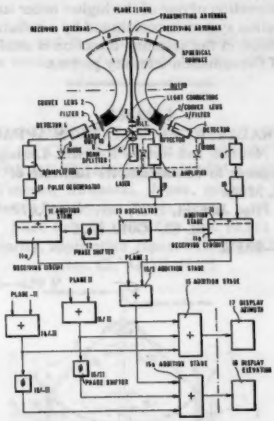
Hans E. Britz, Ludwig-Quidde-Str. 23, 6000 Frankfurt am Main 56, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 651,809, Jan. 23, 1976, Pat. No. 4,099,879. This application Aug. 24, 1976, Ser. No. 717,388

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1975, 2537723

Int. Cl.² H04B *9/00*

U.S. Cl. 455—611 **12 Claims**



1. An antenna comprising a plurality of lens elements arranged over a spherical surface, said lens elements being combined in an axial direction adjacent one another to form a spherical-shaped narrow strip, said strip being arranged so as to transmit and receive electromagnetic radiation.

4,242,579

APPARATUS FOR THE POINTWISE SCANNING OF AN INFORMATION SURFACE

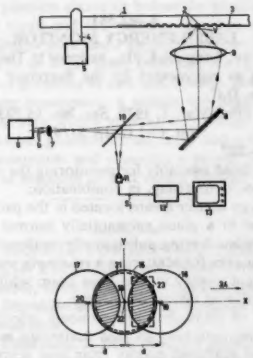
Gijsbertus Bouwhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,230

Claims priority, application Netherlands, May 11, 1978, 7805069

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. Improved apparatus for scanning an information surface with a beam of radiation, the beam and information surface

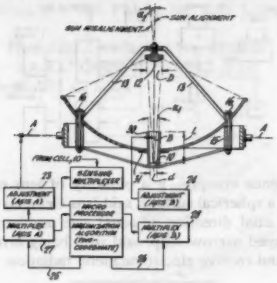
moving relative to each other, in a device for reading a record carrier with an optically readable information structure, which apparatus comprises a radiation source, an illumination objective system for focussing the scanning beam emitted by the radiation source to a scanning spot on the information structure, an observation objective system for concentrating radiation coming from the information surface on the plane of a radiation-sensitive detection system, the improvement being characterized in that the observation objective system is disposed asymmetrically relative to a zero-order subbeam of the radiation coming from the information surface, the asymmetry being in the direction of one of the higher order subbeams and that the detection system is constituted by a radiation detector whose dimension in the scanning direction is small relative to the period of the radiation intensity pattern.

4,242,580

SOLAR-RADIATION COLLECTION APPARATUS

Roy Kaplow, Newton, and Robert I. Frank, Lexington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 11, 1979, Ser. No. 47,077
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—203 R **25 Claims**



1. In solar-radiation collection apparatus, wherein frame structure includes a gimbal-suspension for a radiation-collection optical system and an associated radiation-responsive cell, and wherein the optical system comprises a primary concave mirror with a central aperture and a secondary convex mirror, with the optical focal point behind the aperture and with the cell positioned at the focal point, the improvement wherein a tubular shroud surrounds the cell and the space between the cell and the aperture region of the primary mirror.

4,242,581

LASER ENERGY MONITOR

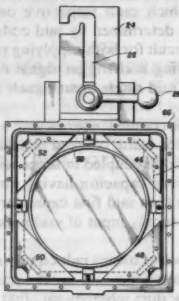
Thomas G. Crow, Longwood, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 1, 1979, Ser. No. 16,703
Int. Cl.³ G02B *5/14*
U.S. Cl. 250—227 **10 Claims**

1. A sensor head assembly for monitoring the optical energy in a laser beam, comprising, in combination:

optical energy scatter means located in the path of said laser beam and in a plane substantially normal thereto, said scatter means having substantially uniformly distributed scattering sites for scattering a relatively small portion of the incident energy in said laser beam while introducing substantially no distortion thereto;

a plurality of photodetector elements selectively located around the periphery of said scattering means to sense integrated scattered energy from said scattering sites to offset spatial variations of energy in said laser beam and generate respective electrical signals in accordance with the energy sensed thereby; wherein said scatter means comprises a scatter plate having front and rear planar faces located in said plane normal to said laser beam, said scatter plate including anti-reflective surfaces and a peripheral edge around which is located said plurality of photodetector elements; and



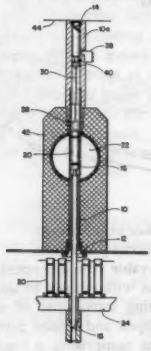
output means coupled to said plurality of photodetector elements for providing a composite output signal representative of the energy contained in the cross section of said output beam.

4,242,582

MEANS FOR EXPELLING SAMPLE CARRIERS FROM A RADIATION MEASURING APPARATUS

Richard S. Kampf, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 6, 1979, Ser. No. 55,254
Int. Cl.³ G01T *1/00*
U.S. Cl. 250—328 **11 Claims**



1. An improved radiation measuring apparatus of the type having a sample carrier for containing the sample of material to be measured, a substantially vertical guiding member for the sample carrier having a sample measuring chamber, and an elevating means for moving the sample carrier in the guiding member to the measuring chamber, the improvement comprising:

a weighted member supported in the guiding member, so positioned and having sufficient mass that its gravitational force causes any sample carrier to be expelled from the measuring chamber as the elevating means descends in a direction away from the measuring chamber; and

a supporting member inside the guiding member supporting the weighted member therein when the weighted member is in its lowered positon, and collapsible inside the guiding

member to remain therein as the sample carrier is elevated by the elevating means toward the measuring chamber.

4,242,583

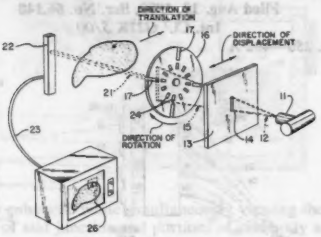
X-RAY IMAGING VARIABLE RESOLUTION

Martin Annis, Newton, and Edwin Frederick, Concord, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Continuation of Ser. No. 782,972, Mar. 30, 1977, abandoned. This application Apr. 26, 1978, Ser. No. 900,380

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—358 R **10 Claims**



1. Radiant energy imaging apparatus for imaging an object as said object is traversed relative to said imaging apparatus comprising:

sources of at least first and second pencil beams of penetrating radiant energy,

at least first and second radiant energy detecting means in fixed relationship to said sources and extending perpendicular to a path of relative motion described by said object, for providing at least first and second detected output signals respectively representative of the intensity of said radiant energy upon said first and second detecting means,

means for scanning with said first and second pencil beams along said first and second radiant energy detecting means respectively to provide first and second image signals respectively representative of the radiant energy response of the object in a region traversed by said first and second pencil beams along first and second paths respectively to said first and second detecting means, and

means for cumulatively combining said first and second image signals so that the portions of the signals combined represent the radiant energy response of corresponding portions of the object in said region to provide a combined image signal having enhanced contrast density relative to that of either of said first and second image signals.

4,242,584

METHOD FOR SEPARATING ISOTOPES WHICH ARE IN THE FORM OF MOLECULES

Gunther Krieg, and Wolfgang Obert, both of Karlsruhe, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

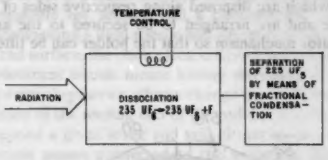
Filed Jun. 22, 1976, Ser. No. 698,499

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528953

Int. Cl.[2] B01D *59/00*

U.S. Cl. 250—423 P **6 Claims**

1. In a method for separating isotopes of an element where the isotopes are in the form of molecules and where the isotopes participate in the vibrations of the molecules, which method includes exciting such molecules by means of radiation and then separating the molecules of at least one isotope from the molecules of at least one other isotope, the improvement comprising selecting isotopes in which a shift of the band edges in their absorption spectra is present due to the isotopy effect, and exciting the isotopes with radiation from a source whose spectrum extends across the region between the band edges of



the one isotope and the other isotope, said exciting being a simultaneous excitation of a plurality of absorption lines.

4,242,585

DENTAL PANORAMIC RADIOGRAPHIC APPARATUS CAPABLE OF CONCURRENTLY TAKING NORMAL PICTURE OF TEMPOROMANDIBULAR JOINT

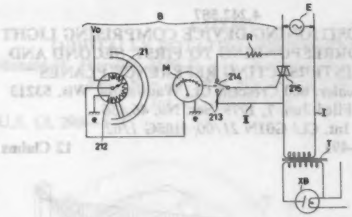
Hiroyoshi Yamano, Kawasaki, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Feb. 23, 1979, Ser. No. 14,751

Claims priority, application Japan, Feb. 23, 1978, 53/20642

Int. Cl.[3] G03B *41/16*

U.S. Cl. 250—439 P **3 Claims**



1. A dental panormaic radiographic apparatus capable of concurrently taking an X-ray picture of a tooth and jaw region and of a temporomandibular joint of a patient comprising a rotatable arm, an X-ray source provided on one end of said arm, an X-ray film provided on another end of said arm opposing said X-ray source and moving in synchronism about a patient's head with said X-ray source when said arm rotates with a constant distance being maintained between said X-ray source and film, said apparatus being characterized in that said apparatus comprises a means for fixing and holding a head of a patient in a position for photographing said tooth and jaw regions and a position above or below the position for photographing said tooth and jaw regions for photographing said temporomandibular joint and a means for starting and stopping the irradiation of an X-ray beam from said X-ray source in any of a plurality of positions as said arm rotates, said starting and stopping means comprising a means for sensing rotational position of said arm which generates a voltage which varies with the rotational position of said arm and a switching element which interrupts and connects a power source to said X-ray source in response to said varied voltage.

4,242,586

SPECIMEN HOLDER FOR ELECTRON MICROSCOPY AND ELECTRON DIFFRACTION

Charles E. Warble, Glen Waverley, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Aug. 2, 1979, Ser. No. 63,307

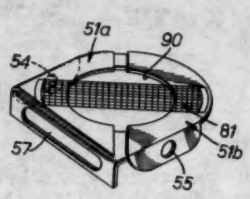
Claims priority, application Australia, Aug. 8, 1978, PD5407

Int. Cl.[3] G01N *23/00*; G21K *5/08*

U.S. Cl. 250—443 **16 Claims**

1. A specimen holder arranged in use to be supported on

three sides in an electron instrument by the arms of a manipulator mechanism, the holder comprising a base structure with an aperture therein, the base structure having three projecting flanges which are disposed along respective sides of the base structure and are arranged to be secured to the arms of a manipulator mechanism so that the holder can be tilted by the



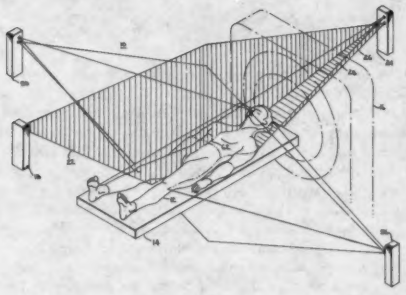
manipulator, characterised in that the base structure comprises a first component of thin sheet material secured in superimposition to a pair of mutually spaced but co-planar sub-components of thin sheet material electrically isolated from said first component, the sub-components respectively integrally carrying two of said flanges and the sub-components and their flanges being electrically conductive.

4,242,587

PATIENT POSITIONING DEVICE COMPRISING LIGHT PLANES CORRESPONDING TO FIRST, SECOND AND THIRD INTERSECTING REFERENCE PLANES

Charles Lescrenier, 660 Crescent Ct., Wauwatosa, Wis. 53213

Filed Jun. 7, 1979, Ser. No. 46,436
Int. Cl.[2] G01N *21/00*; H05G *1/62*
U.S. Cl. 250—491 **12 Claims**



1. A device for orienting a body along first, second, and third intersecting reference planes, said device comprising:

first light source means for establishing a first plane of light lying in said first reference plane and appliable to the body to be oriented;

second light source means establishing second and third planes of light intersecting at a predetermined angle and applicable to the body, said second plane of light being coplanar with said first light plane, said third plane of light lying in said second reference plane;

a third light source means establishing fourth and fifth planes of light intersecting at a predetermined angle and appliable to the body, said third light source means lying to one side of said first and second light planes and intersecting said light planes at a predetermined angle, said fourth light plane being coplanar with said third light plane and said fifth light plane lying in said third reference plane; and

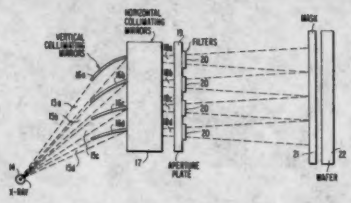
a fourth light source for establishing sixth and seventh light planes intersecting at a predetermined angle and appliable to the body, said fourth light source lying to the opposite side of said first and second light planes from said third light source means and establishing said sixth and seventh light planes so that they intersect said first and second light planes at a predetermined angle, said sixth light plane being coplanar with said third and fourth light planes and said seventh light plane being coplanar with said fifth light plane.

4,242,588

X-RAY LITHOGRAPHY SYSTEM HAVING COLLIMATING OPTICS

John K. Silk, Wellesley; Allen S. Krieger, Lexington, and Eugene W. C. Huang, Lynnfield, all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Aug. 13, 1979, Ser. No. 66,140
Int. Cl.[3] G21K *5/00*
U.S. Cl. 250—492 A **13 Claims**



1. In an X-ray lithography system for the production of microelectronic circuits, of the type comprising a wafer that is covered with a photosensitive material, and a mask disposed adjacent said wafer and having detailed circuit patterns thereon which are irradiated onto said wafer by soft X-rays thereby to replicate said mask patterns, the improvement wherein said soft X-rays are produced in said system by X-ray illumination means operative to produce a beam of substantially collimated X-rays at said mask, said illumination means comprising an X-ray source spaced from said mask and operative to produce a plurality of input beams of X-rays, means for collimating said input X-ray beams, said collimating means comprising an array of grazing incidence mirrors located between said source and said mask and positioned relative to said input beams at sufficiently small grazing angles to cause the X-rays in each input beam to be totally externally reflected by said mirrors, whereby said array of grazing incidence mirrors produces a plurality of output X-ray beams which are spaced from one another at the output of said collimating means and which are projected in substantially parallel relation to one another from the output of said collimating means toward said mask, each of said output beams exhibiting a small divergence operative to cause the gap between said output beams to decrease with increasing distance from said collimating means and operative to cause said output beams to merge into a single, comparatively large cross-sectional area, composite beam of X-rays at a plane spaced from said collimating means, said mask being positioned substantially in said plane for illumination by said composite beam of X-rays.

4,242,589

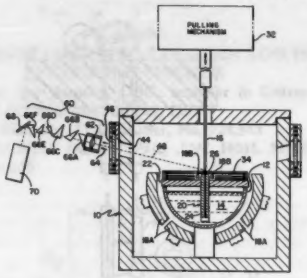
APPARATUS FOR MONITORING CRYSTAL GROWTH

Emanual M. Sachs, Watertown, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Jan. 15, 1979, Ser. No. 3,278
Int. Cl.[3] G01N *2/26*
U.S. Cl. 250—577 **24 Claims**

1. A system for monitoring the growth of a crystalline body of selected material from a growth pool of melt so that said body has a selected cross-sectional shape for some preselected distance along its length, said growth pool being characterized by a meniscus which joins said body at said growth pool to form a solid/liquid/vapor junction, said system comprising, in combination:

optical means for forming an image of at least the entire width of said junction and the portions of said body and meniscus above and below said junction, and for sufficiently enlarging said image in the height dimension of the image generally perpendicular to the observed direction of said junction relative to the width dimension of the image generally perpendicular to the height dimension so that the resolution of the height dimension of the image



can be enhanced while simultaneously viewing the entire width of said junction and portions of said body and meniscus above and below said junction; and

video display means comprising means for generating an analog video signal representative of said image, means for digitizing said analog video signal so as to produce a digitized video signal for displaying said image, wherein said means for digitizing said analog video signal enhances the contrast of said image on said display means.

4,242,590

LIQUID LEVEL DETECTOR WITH HYSTERESIS MEANS

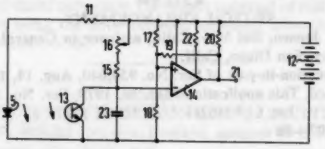
Wolfgang von Tlück, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,938

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717089

Int. Cl.³ G01F *23/00*

U.S. Cl. 250—577 **6 Claims**



1. An indicating device for showing the level of fluids in fluid containers, comprising: a single transparent rod terminating in a sensing end which is immersed in the fluid when the container is filled, the sensing end of which dipping in the fluid being formed such that a beam of light running in the transparent rod undergoes total reflection at the sensing end when the sensing end is not in contact with the fluid; at an end surface of the rod opposite the sensing end a photoelectric device is disposed comprising a light source and a light receiver both on the same end surface; the photoelectric device being connected with an electrical circuit means having switching means for actuating a warning device when a change occurs in the reflection behavior of the sensing end of the rod due to a fluid level change beyond a given level; and said circuit means comprising hysteresis means connected to the switching means for maintaining the switching means in a switched over condition despite a predetermined amount of occasional contact between the sensing end and the fluid due to slopping of the fluid but releasing the switched over condition when the fluid level changes by more than said predetermined amount at said given level.

4,242,591

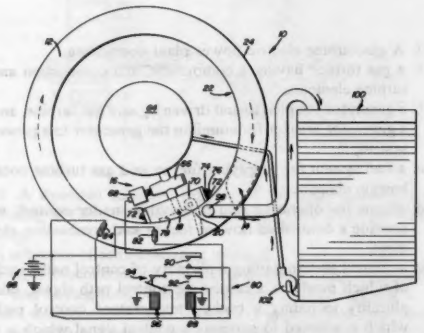
ORBITALLY ROTATING PISTON ENGINE

Ronald W. Harville, 3103 D. Ave., National City, Calif. 92050

Filed Nov. 17, 1978, Ser. No. 961,887

Int. Cl.³ H02P *9/04*

U.S. Cl. 290—1 R **14 Claims**



1. An orbitally rotating free piston engine comprising:

a stationary piston chamber configured in a hollow annulus;

a piston disposed within said chamber and capable of orbitally traversing said chamber;

valving means for closing off said chamber when not in contact with said piston and opening said chamber when contacted by said piston, said valving means including a shutter valve which extends across said hollow annulus, said shutter valve being pivotally connected to the chamber wall, and a recess disposed in the chamber wall proximate the shutter valve for receiving the shutter valve when said piston contacts said shutter valve forcing the shutter valve to pivot away from its position across said hollow annulus;

energy transfer means for causing a reaction against said valving means for imparting motion to said piston; and

power removal means for removing usable energy from said engine.

4,242,592

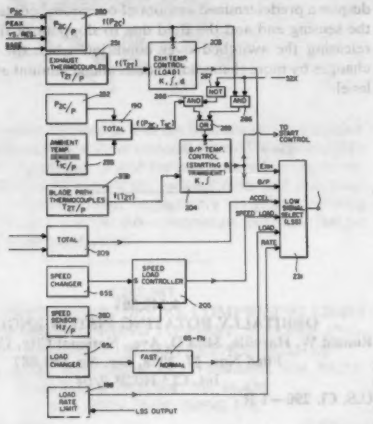
GAS TURBINE POWER PLANT CONTROL APPARATUS INCLUDING AN AMBIENT TEMPERATURE RESPONSIVE CONTROL SYSTEM

Robert A. Yannone, Aldan, and James J. Shields, Philadelphia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 601,578, Aug. 1, 1975, abandoned, which is a division of Ser. No. 371,628, Sep. 20, 1973, abandoned. This application Oct. 11, 1977, Ser. No. 843,005

Int. Cl.[2] F02C 9/04

U.S. Cl. 290—40 R 23 Claims



1. A gas turbine electric power plant comprising:

a. a gas turbine having a compressor, and combustion and turbine elements;

b. a generator coupled to and driven by said gas turbine, and a generator breaker for coupling the generator to a power system;

c. a fuel system for supplying fuel to said gas turbine combustion element;

d. means for operating said fuel system under control, to provide a controlled flow of fuel to said combustion element;

e. a control system having a plurality of control paths each of which produces a respective control path signal, said plurality including a backup temperature control path which is adapted to generate a control signal which is a function of turbine ambient temperature at least part of the turbine operating time, said control system having means for selecting one of said signals produced by said control paths on a predetermined basis, said selecting means selecting the lowest of said signals;

f. means for operatively connecting said selected signal to said operating means;

g. means for producing a signal representative of ambient temperature, said temperature path containing a function generator, said ambient temperature signal being coupled to said function generator during a predetermined turbine operating period to generate a setpoint signal for said function generator during said turbine operating period;

h. means for coupling the temperature signal to said function generator such that said setpoint signal is a function of ambient temperature during said turbine operating period which is before generator breaker closing; and

i. means for generating said setpoint signal as a function of selected load level after generator breaker closing.

4,242,593

DEVICE FOR CONVERTING SEA WAVE ENERGY INTO ELECTRICAL ENERGY

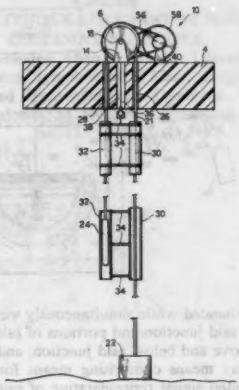
Carlo A. Quilico, and Paolo M. Troya, both of Turin, Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed Nov. 9, 1978, Ser. No. 959,272

Claims priority, application Italy, Nov. 21, 1977, 69620 A/77

Int. Cl.[3] F03B 13/12

U.S. Cl. 290—53 12 Claims



1. A device for converting sea wave energy into electrical energy comprising a floating platform, a shaft rotatably supported on said platform, a pulley mounted on said shaft for rotation therewith, a cable extending over said pulley, means for anchoring one end of said cable to the sea bed during use of the device, a counterweight secured to the opposite end of said cable, two hollow cylinders secured to and extending downwardly from said platform with their axes perpendicular to said platform in which said cable is guided on opposite sides of said pulley with said counterweight being movably disposed within one of said hollow cylinders, and electrical generator means mounted on said platform and operatively connected to said shaft to be driven thereby.

4,242,594

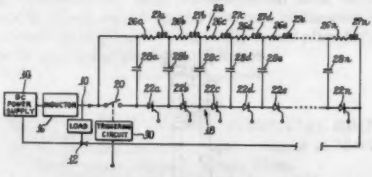
SWITCH ARRANGEMENT

Torkil H. Jensen, Del Mar, Calif., assignor to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 933,640, Aug. 14, 1978, abandoned. This application Mar. 16, 1979, Ser. No. 20,963

Int. Cl.[3] H02H 7/22; H03K 17/72

U.S. Cl. 307—98 7 Claims



1. A switch arrangement for interrupting a direct current of high amperage and voltage, comprising a pair of terminals, a current interrupting means connected by one end to one of said terminals, a plurality of thyristors serially connected in the forward direction between the other end of said current interrupting means and said other terminal, whereby when the current interrupting means is in a conductive state the direct current flows through said plurality of thyristors, a plurality of sets of a resistor series connected with a nonlinear element, said

nonlinear element having a characteristic such that it impedes current flow when the voltage thereacross or the time integral of the voltage is small and more freely allows current flow through it when the voltage or time integral of the voltage is large, means for serially connecting said sets between said terminals, said resistor-nonlinear element sets being associated with respective thyristors, and a plurality of capacitors being coupled between respective associated resistor-nonlinear element sets and thyristors.

4,242,595

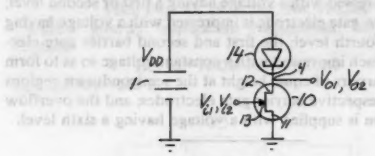
TUNNEL DIODE LOAD FOR ULTRA-FAST LOW POWER SWITCHING CIRCUITS

Kurt Lehovec, Los Angeles, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Jul. 27, 1978, Ser. No. 928,543

Int. Cl.³ H03K *19/094, 3/315, 3/42;* **H01L** *29/80*

U.S. Cl. 307—205 **13 Claims**



1. A switching circuit comprising a field effect transistor, means for applying at least two input voltages to the gate of said field effect transistor, whereby source-to-drain resistance of said transistor is low for a first of said input voltages, and high for a second of said input voltages, the drain of said field effect transistor electrically connected through a tunnel diode load to a power supply voltage which biases said tunnel diode in the forward direction, said power supply voltage chosen such that the current flowing through said tunnel diode is substantially less than the peak current of said tunnel diode and only moderately larger than the valley current of said tunnel diode when said first input voltage is applied, said first input voltage being sufficiently large and said second input voltage being sufficiently small so that the current-voltage characteristic of said field effect transistor for each of said field and second input voltages intersects the current-voltage load line of said tunnel diode only once, the output terminal of said switching circuit being the node between said field effect transistor and said tunnel diode.

4,242,596

INTEGRATED INJECTION LOGIC CIRCUITS

Kenneth R. Whight, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

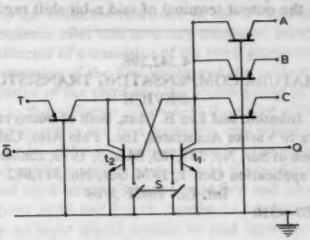
Filed Jul. 10, 1978, Ser. No. 922,964

Claims priority, application United Kingdom, Jul. 14, 1977, 29615/77

Int. Cl.³ H03K *19/091*

U.S. Cl. 307—211 **13 Claims**

1. An integrated injection logic circuit comprising at least one threshold logic gate having a plurality of weighted logic inputs and a weighted fixed input determining the threshold, said gate comprising first and second transistors connected as a bistable with the collector zone of the first transistor connected to the base zone of the second transistor and the collector zone of the second transistor connected to the base zone of the first transistor, at least one of said first and second transistors having a further collector zone provided with a conductive, output connection, a plurality of current injector structures being present for determining the bias currents supplied to the first and second transistors, the state of said bistable being determined in accordance with the difference in magnitude of total bias current supplied to the first transistor and total bias current supplied to the second transistor, said plurality of current injector structures comprising injector structures associated



with the logic inputs and at least one injector structure associated with a fixed input.

4,242,597

GUNN EFFECT SHIFT REGISTER

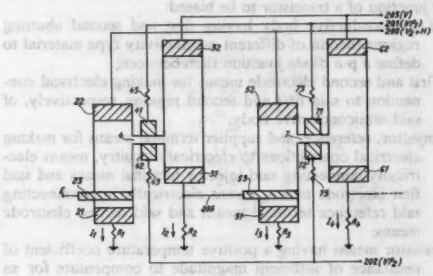
Maurice Gloanec, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 2, 1978, Ser. No. 956,976

Claims priority, application France, Nov. 4, 1977, 77 33238

Int. Cl.³ H01L *27/26;* **G11C** *19/28*

U.S. Cl. 307—221 B **3 Claims**



1. A dynamic memory register of the type utilizing the traveling of Gunn domains in a semiconductor material, comprising:

a substrate of semi-insulating material;

a layer of semiconductor material disposed on said substrate and having a differential mobility of charge carriers;

said semiconductor material being organized in a succession of register elements from 1 to n, with n being an integer greater than 1, together constituting an n-bit shift register;

each of said elements comprising a first and a second band connected by a bridge of the same semiconductor material;

said first band being organized in a Gunn-effect triode with a first starting electrode, a gate and a first finishing electrode, a distance L separating the first gate and the first finishing electrode;

said second band being substantially parallel to said first band, having a second starting electrode and a second finishing electrode and being connected to said first band by said bridge at a distance L_1 from said first gate and at a distance L_2 from said second finishing electrode, the lengths L, L_1 and L_2 satisfying the relationship

$$L_1+L_2>L$$

said gate of each register element forming the input terminal of said register element;

said second starting electrode of each register element being connected to said gate of the following register element; and said second starting electrode of the n^{th} register element being the output terminal of said n-bit shift register.

4,242,598

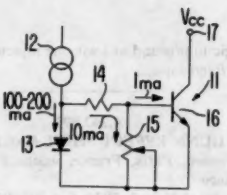
TEMPERATURE COMPENSATING TRANSISTOR BIAS DEVICE

Joseph H. Johnson, and Lee B. Max, both of Sunnyvale, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 337,783, Mar. 5, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,882

Int. Cl.[3] **H03F** *3/04*

U.S. Cl. 307—310 **18 Claims**



1. In a semiconductive device for providing a temperature compensated bias output to be applied across the base-to-emitter junction of a transistor to be biased:

a semiconductive body having first and second abutting regions therein of different conductivity type material to define a p-n diode junction therebetween;

first and second electrode means for making electrical connection to said first and second regions, respectively, of said semiconductive body;

injector, reference, and supplier terminal means for making electrical connections to electrical circuitry, means electrically connecting said injector terminal means and said first electrode means, means electrically interconnecting said reference terminal means and said second electrode means;

resistor means having a positive temperature coefficient of resistance of sufficient magnitude to compensate for an increasing temperature coefficient of h_{FE} of the transistor to be biased, means for electrically connecting said resistor means between said supplier terminal means and said injector terminal means; and

means for mounting said semiconductive body and said resistor means in heat exchanging relation with the transistor to be biased to provide a temperature compensated bias potential across said supplier and reference terminal means as an output to be applied in circuit with the base-to-emitter junction of the transistor to be biased.

4,242,599

CHARGE TRANSFER IMAGE SENSOR WITH ANTIBLOOMING AND EXPOSURE CONTROL

Nobuo Suzuki, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

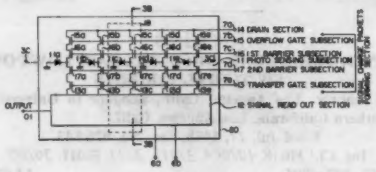
Filed Jan. 29, 1979, Ser. No. 7,173

Claims priority, application Japan, Feb. 22, 1978, 53-18542

Int. Cl.[3] **H03K** *3/42;* **G11C** *19/28;* **H01L** *29/78, 27/14*

U.S. Cl. 307—311 **9 Claims**

1. A charge transfer image sensor which comprises a signal-readout section for receiving a group of signal charge packets and sending forth an image signal; an overflow drain section; and a signal charge packet-forming section which is disposed between the signal-readout section and overflow drain section, includes a plurality of unit signal charge packet-forming regions and supplies a group of unit signal charge packets to the signal-readout section, and wherein the unit signal charge packet-forming section includes a photosensing region for producing a charge corresponding to the intensity of an incoming light, a first barrier gate electrode and overflow gate electrode arranged in series between the photosensing region and overflow drain section, and a second barrier gate electrode and signal charge packet transfer gate electrode provided in series between the photosensing region and an input of the signal-readout section; the signal charge packet transfer gate elec-



trode is impressed with a voltage having a first or second level; the overflow gate electrode is impressed with a voltage having a third or fourth level; the first and second barrier gate electrodes are each impressed with a constant voltage so as to form potential barriers of equal height at the semiconductor regions under the respective barrier gate electrodes; and the overflow drain section is supplied with a voltage having a sixth level.

4,242,600

DIGITAL CCD ARRANGEMENT

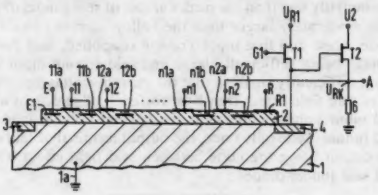
Kurt Hoffmann, Taufkirchen, and Manfred Mauthe, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,939

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2721039

Int. Cl.[3] **G11C** *19/28;* **H01L** *29/78*

U.S. Cl. 307—221 D **6 Claims**



1. A digital charged coupled device (CCD) circuit arrangement comprising a semiconductor substrate of one conductivity type, a layer of insulating material on one surface of said substrate, a plurality of shift electrodes separated from said substrate by said insulating layer; one group of said electrodes lying in one plane and separated from said substrate by a relatively thick portion of said layer of insulating material, a second group of said electrodes lying in a lower plane and separated from said substrate by a relatively thin portion of said layer of insulating material, one electrode on said one plane and, an adjacent one electrode on said lower plane being electrically connected to form a pair, the remaining shift electrodes being similarly paired, a first pulse train voltage source connected seriatim to every other one of said pairs, a second pulse train voltage source displaced in phase relative to said first pulse train voltage source and connected seriatim to the remaining pairs of said shift electrodes, said substrate having an input end diffused zone of the opposite conductivity type to said substrate, an input electrode in said insulating layer in said lower plane ahead of the first of said shift electrode pairs, said substrate having a ground terminal, an output end diffusion zone of said opposite conductivity type on said substrate, an

output end electrode lying in said one plane and constantly connected to a first reference voltage source, a field effect transistor having its drain connected to said first reference voltage source and its source connected to said output end diffused zone and its gate connected to a pulse train voltage source which is in phase with but having less pulse width than said first pulse train voltage source, a second field effect transistor having its drain connected to said second pulse train voltage source and its gate connected to said source of said first transistor, an output terminal, an impedance element connected through a circuit node between the source of said second field effect transistor and ground, said circuit node being connected to the last of said electrode pairs and to said output terminal.

4,242,601

CIRCUIT ARRANGEMENT FOR FREQUENCY DIVISION

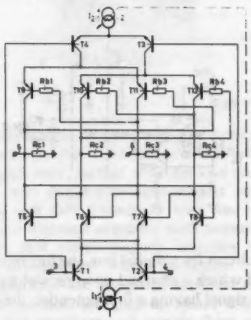
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,680

Claims priority, application Netherlands, Nov. 9, 1977, 7712314

Int. Cl.³ H03K *23/00, 27/00*

U.S. Cl. 307—225 R **12 Claims**



1. A circuit for frequency division comprising, first and second input terminals, first and second transistors having emitter electrodes connected in common, first and second groups of transistors with each group comprising n transistors, n being at least two, each of said transistors having a collector, a base and an emitter, means connecting the emitter electrodes of the transistors of the first and second groups to the collector electrodes of the first and the second transistor respectively, to form a first cyclic electrical sequence of transistors with said sequence alternating between said first and second groups so that each transistor of one group is followed in said sequence by a transistor of the other group, means coupling the base electrodes of the transistors of the first cyclic sequence to the collector electrodes thereof so that the base electrode of any arbitrary transistor of the first cyclic sequence is always coupled to the collector electrode of the (n−1) transistor of said first sequence after said arbitrary transistor, means coupling each collector electrode of the transistors of said first and second groups via a load to a point of reference voltage, third and fourth transistors having emitter electrodes connected in common, third and fourth groups of transistors with each group comprising the same number of n transistors as are present in the first and second groups of transistors, each of said transistors having a collector, a base and an emitter, means connecting the emitter electrodes of the transistors of the third and the fourth groups to the collector electrodes of the third and the fourth transistor respectively, to form a second cyclic electrical sequence of transistors with said second sequence alternating between said third and fourth groups so that each transistor of one group is followed in said sequence by a transistor of the other group, means coupling the base electrodes of the transistors of the third and fourth groups to the collector electrodes thereof so that the base electrode of any arbitrary transistor of the second cyclic electrical sequence is always coupled to the collector electrode of the n^{th} transistor of said second sequence after said arbitrary transistor, means connecting the collector of a transistor of the third group to the collector of a transistor of the first group and the collector of every next transistor of the third and the fourth group in the second sequence to the collector of the next transistor of the first and the second group in the first sequence, and wherein said first, second, third and fourth transistors each have a control electrode, and means coupling said control electrodes to said first and second input terminals so that said first and second transistors and said third and fourth transistors are turned on alternately by an input signal applied to said input terminals and with the first and fourth transistors simultaneously conductive and the second and third transistors simultaneously conductive.

4,242,602

PHASE COMPARATOR CIRCUIT WITH GATED ISOLATION CIRCUIT

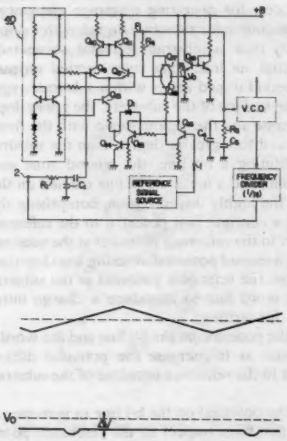
Isao Nakagawa, and Keiichi Mizutani, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 6, 1978, Ser. No. 967,051

Claims priority, application Japan, Dec. 7, 1977, 52/146054

Int. Cl.³ H03L *7/06*

U.S. Cl. 307—232 **3 Claims**



1. A phase comparator circuit suited for use in a phase locked loop and for an integrated circuit implementation comprising:

a reference signal source for supplying a reference signal composed of pulse signals;

means for converting a signal to be phase-compared with said reference signal to a signal of waveform having a ramp portion;

means for receiving said reference signal and an output signal of said converting means to produce a current indicative of the voltage of said ramp portion of said output signal of said converting means during a period in which each pulse of the pulse signals of said reference signal is being applied;

an output circuit including a load resistor for converting said current output to a voltage;

a reference D.C. voltage node; and

gate means connected between said load resistor and said

reference D.C. voltage node and operative to conduct only when said reference pulse signal is being applied and to isolate said load resistor from said reference D.C. voltage node during the remaining period to thus maintain said output voltage substantially constant during said remaining period.

4,242,603

DYNAMIC STORAGE ELEMENT

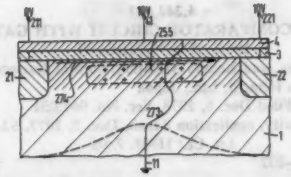
Guenther Meusburger, Munich; Karl Knauer, Starnberg, and Jenoe Tihanyi, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,013

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 2726014

Int. Cl.³ H01L *27/04*

U.S. Cl. 307—238 **2 Claims**



1. A process for operating a storage element which comprises a semiconductor substrate doped with a dopant of a first conductivity type, a substrate terminal connected to a reference potential, an insulating layer carried on said substrate, first and second doped zones with a substrate region therebetween at the surface of the substrate, the zones doped opposite to the substrate and the region doped with the first conductivity dopant and to a greater degree than the substrate, the first zone constituting a bit line, the second zone constituting a reference line, and a metal word line carried on the insulating layer over the highly doped region, comprising the steps of:

applying a constant first potential to the reference line with respect to the reference potential at the substrate terminal;

applying a second potential differing less than the first potential from the reference potential at the substrate terminal to the word line to introduce a charge into the doped region for writing;

altering the potential on the bit line and the word line in such a manner as to increase the potential differences with respect to the reference potential of the substrate terminal; and

altering the potential on the bit line to increase the potential difference with respect to the reference potential at the substrate terminal, while maintaining the potential constant on the word line to write a "1".

4,242,604

MOS INPUT CIRCUIT WITH SELECTABLE STABILIZED TRIP VOLTAGE

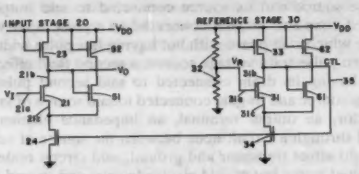
Frederick J. Smith, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 10, 1978, Ser. No. 932,516

Int. Cl.³ H03K *17/687, 17/14, 19/092, 3/356*

U.S. Cl. 307—251 **10 Claims**

1. An integrated buffer circuit having a selectable stabilized trip voltage; said circuit comprising an input stage and a reference stage; each of said stages including a field effect input transistor, first resistive means coupling a drain of said input transistor to a bias source for providing a resistance there between that is substantially constant, and second resistive means coupling a source of said input transistor to another bias source for providing a resistance there between that is variable in response to control signals applied thereto; means for biasing said reference stage in the linear region at said trip voltage; and



means for coupling signals generated by said reference stage to all of said second resistive means as said control signals.

4,242,605

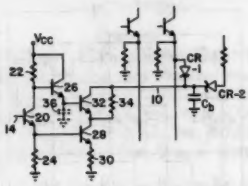
TRANSIENT ARRAY DRIVE FOR BIPOLAR ROM/PROM

Walter C. Seelbach, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1978, Ser. No. 908,311

Int. Cl.³ H03K *3/01, 3/26, 17/56*

U.S. Cl. 307—270 **5 Claims**



1. A driving circuit for a digital line, the line having a capacitance to ground which is charged upon receipt by said driving circuit of a line signal having a first potential, the combination comprising:

limiting means coupled between said capacitance and ground for limiting discharge current of said capacitance, said capacitance discharging upon receipt by said driving circuit of a line signal having a second potential;

transistor means coupled across said limiting means for momentarily shorting said limiting means to shorten discharge time, said transistor means including charge storage means which is charged in response to said line signal of said first potential; and

series switching means coupled between ground and said limiting means for providing a discharge path for said capacitance in response to said line signal having said second potential.

4,242,606

MAGNETIC FINAL CONTROL ELEMENT FOR A REGULATOR APPARATUS

Wolfgang Nonnenmann, Pforzheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,496

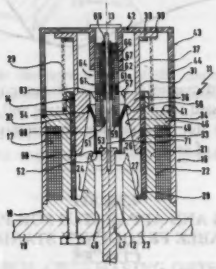
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809975

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—12 **12 Claims**

1. A magnetic final control element for a regulator apparatus for use in an electronically regulated fuel injection system for motor vehicles, in which the regulatory value is determined by means of the axial stroke of a rod-like control member connected with an armature of an electromagnet disposed in a housing, the armature being movable against the restoring

force of a helical spring means, the exciter current of said magnet being the output value of a regulator which as a guidance value receives a set-point signal characteristic of the regulatory value and as an input value to be compared therewith receives an output signal of a displacement transducer which is proportional to the stroke of said rod-like control member, said displacement transducer further comprising a rod-like means which is displaceably coupled with the armature and further including a pick-up means associated with said housing and arranged to extend substantially along the axis of a transducer core, said transducer further having an output signal proportional to its stroke and influenced by the position thereof, and further wherein said electromagnet comprises an armature magnet having an attracting force proportional to



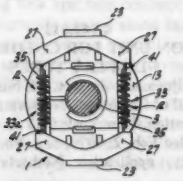
said exciter current, said current eminating from an exciter coil which is wound onto the outer jacket of a substantially cylindrical-cup-shaped core, further wherein said control member together with said displacement transducer comprising said pick-up means and said transducer core and said restoring spring means are disposed coaxially with respect to the longitudinal axis of said electromagnet, whereby said restoring spring means is supported with a minimum initial stressing between a support surface integrated into said armature and a further support surface, said pick-up means being disposed in proximity to said armature and remote from said core, said pick-up means having an end portion secured on the inner side of a cover plate firmly connected with said core and said transducer rod-like means is embodied as an element affixed to said control member.

4,242,607

CENTRIFUGAL ACTUATOR FOR MOTOR STARTING SWITCH

Eugene F. Hildebrandt, Ferguson, and William D. Crow, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 26, 1979, Ser. No. 14,844
Int. Cl.³ H01H *35/10*
U.S. Cl. 310—68 E **6 Claims**



1. In an electric motor having a starting winding, a starting switch for energizing and deenergizing the starting winding, a rotor shaft, and a centrifugal actuator for actuation of said starting switch, said centrifugal actuator being rotatable with said rotor shaft, said centrifugal actuator having a pair of movable members disposed on opposite sides of said rotor shaft centrifugally responsive to the rotational speed of the shaft for moving outwardly from a starting position to a run position upon rotation of said rotor shaft at a predetermined operational speed, means for resiliently biasing said movable members toward their starting position, said movable members being movable from their run to their starting positions upon said shaft slowing down from said predetermined speed, said centrifugal actuator being adapted to be operatively interconnected to said starting switch so as to effect opening and closing thereof as said centrifugal actuator moves between its starting and its run position, wherein the improvement comprises: said centrifugal actuator biasing means including a pair of compression coil springs, a pair of linkages, one for each of said springs, each said linkage interconnecting a respective said spring between said movable members, each of said linkages comprising a first element engageable with one end of its respective compression coil spring and with the movable member opposite said one end of said compression spring and a second element engageable with the other end of said compression coil spring and with the other movable member so that movement of said movable members from their starting to their run positions causes said first and second elements to move relative to one another and causes said spring to be resiliently compressed.

4,242,608

MOTOR USING HALL EFFECT ELEMENTS

Yasuhiro Ishigaki, and Toshio Sugiyama, both of Toyokawa, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 24, 1978, Ser. No. 927,393
Claims priority, application Japan, Jul. 25, 1977, 52/88412
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 R **10 Claims**

1. A motor using Hall effect elements, comprising:

a disk-shaped multi-pole magnet coupled to a rotary shaft and circumferentially divided into a plurality of magnetic poles each magnetized in the direction of thickness thereof in an opposite polarity to its adjacent magnetic poles;

a yoke plate for rotatably supporting said rotary shaft, said yoke plate being disposed to face said multi-pole magnet to define an air gap therebetween;

a pair of drive coils disposed within said air gap and angularly displaced from each other by an electrical angle of 90°, said pair of drive coils linking to a magnetic flux of said multi-pole magnet;

a pair of Hall effect elements spaced from said yoke plate and disposed within said air gap, said pair of Hall effect elements linking to the magnetic flux of said multi-pole magnet;

said pair of Hall effect elements being angularly displaced from each other by an electrical angle of 90° for developing output voltages thereacross in the polarities determined by the polarities of the magnetic poles of said multi-pole magnet;

means for supplying said output voltages of said pair of Hall effect elements to said pair of drive coils, respectively; and

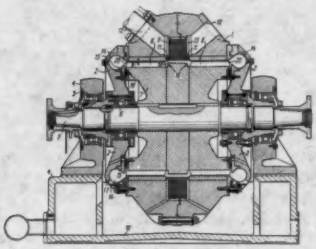
a pair of pole pieces disposed to face said pair of Hall effect elements, respectively, and magnetically coupled to said yoke plate for adjusting magnetic flux densities of said multi-pole magnet applied to said pair of Hall effect elements.

4,242,609

WATER-COOLED ELECTROMAGNETIC BRAKE

Nikolai A. Burenkov, ulitsa Molostovykh, 2, korpus 2, kv. 54; Mikhail G. Derevyanchenko, ulitsa Saratovskaya, 3, korpus 2, kv. 126; Rikhard A. Ioganson, Kutuzovsky prospekt, 4, kv. 6; Alexandr V. Kuprianov, Chuxin tupik, 5, kv. 73; Mark B. Perchenok, ulitsa Chasovaya, 27/12, kv. 16; Evgeny V. Chegodaev, ulitsa Novgorodskaya, 34, kv. 317, and Valentin I. Chulin, ulitsa Novo-Petrovskaya, 18, kv. 49, all of Moscow, U.S.S.R.

Filed Dec. 4, 1978, Ser. No. 966,062
Int. Cl.³ H02K *49/02*
U.S. Cl. 310—105 **1 Claim**



1. A water-cooled electromagnetic brake comprising an annular stator defining a central enclosure, stator end covers, a rotor rotatably mounted in said enclosure, peripheral pole teeth on said rotor and defining a gap between an inner surface of said stator and outer edges of said pole teeth, an excitation winding in said stator, a perforated ring supporting said excitation winding, said ring having an inner surface adjacent said outer edges of said pole teeth, toroid-shaped collectors for cooling liquid in said stator covers, said collectors having openings adjacent the periphery of said rotor for the introduction of cooling liquid fed from said gap to said collectors, ports in the lower portion of said collectors for the removal of cooling liquid, means for circulating liquid around said excitation winding, through said perforated ring, along said gap and into said collectors, said pole teeth defining recesses adjacent said ring for inhibiting reverse flow of the liquid, said pole teeth further having projections extending into said openings of said collectors, said collectors having an inner edge adjacent said opening defining a liquid deflecting baffle and labyrinth seal means between said rotor and said stator adjacent each said baffle.

4,242,610

WEDGE-SHAPED PERMANENT MAGNET ROTOR ASSEMBLY

Frederick B. McCarty, San Pedro, and Alexander Silver, Tarzana, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 26, 1978, Ser. No. 973,346
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **6 Claims**

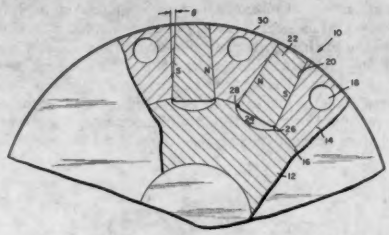
1. In an electrical machine having a rotor and a stator, said rotor comprising:

a cylindrical hub;

a plurality of inwardly converging wedge-shaped support members located around and affixed to the periphery of said hub;

a plurality of wedge-shaped permanent magnets with radially extending outwardly converging sides disposed between said support members;

said sides of said magnets forming an angle within the range of 2 to 9 degrees with a plane parallel to a central radius



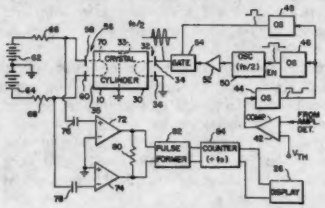
through said magnet such that the magnets are locked in place after said rotor ceases to rotate and the magnets will not fracture due to excessive compressive forces applied to the sides of said magnets.

4,242,611

METHODS AND APPARATUS FOR PROVIDING ULTRA-STABLE FREQUENCY STANDARDS AND CLOCKS

David H. Douglass, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed May 23, 1977, Ser. No. 799,800
Int. Cl.³ H01L *41/00*
U.S. Cl. 310—344 **40 Claims**



1. The method of generating signals for use in frequency standards and clocks of high stability, said method comprising the steps of supporting a body consisting of a single crystal non-piezoelectric material having a mass of the order of kilograms for free vibration as a mechanical resonator at a frequency at which said body is resonant, exciting resonant, non-piezoelectric vibration of said body, and deriving said signals in response to said vibration.

4,242,612

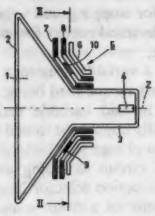
DEFLECTION UNIT FOR COLOR TELEVISION DISPLAY TUBES

Werner A. L. Heijnemans; Joris A. M. Nieuwendijk, and Nicolaas G. Vink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1979, Ser. No. 8,663
Claims priority, application Netherlands, Feb. 6, 1978, 7801316
Int. Cl.³ H01F *3/00*
U.S. Cl. 313—421 **5 Claims**

1. A deflection unit for a color television display tube having a neck portion, a display screen and a funnel central portion therebetween, said deflection unit comprising a core, a pair of vertical deflection coils, and a pair of horizontal deflection

coils, said pair of vertical deflection coils having a winding distribution for producing, when the deflection unit is mounted on said display tube, a pin cushion-shaped vertical deflection field at the neck side of the unit and a homogeneous vertical



deflection field at the screen side of the deflection unit, said deflection unit further comprising flux altering means which, in combination with said pair of vertical deflection coils, produce a sharp barrel-shaped vertical deflection field at the central portion of the unit for correcting astigmatism distortion.

4,242,613

CRT CONTROL GRID HAVING ORTHOGONAL OPENINGS ON OPPOSITE SIDES

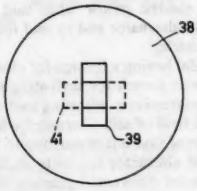
Jörg Brambring, and Robert F. L. M. van der Ven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,435

Claims priority, application Netherlands, Nov. 24, 1977, 7712943

Int. Cl.³ H01J *29/02, 29/56*

U.S. Cl. 313—447 **8 Claims**



1. A cathode-ray tube comprising, in an evacuated envelope, a target and an electron gun for generating an electron beam directed onto said target, said electron gun including a cathode centered about a first axis, a first electrode disposed adjacent said cathode and spaced therefrom along said first axis, said first electrode having first aperture centered about said first axis, and a second electrode spaced along said first axis from said first electrode and having a second aperture centered about said first axis, said first electrode having, on the side of said first electrode adjacent said cathode, an elongated opening communicating with said first aperture so that said first electrode and said cathode from a non-rotationally symmetrical multipole electron lens which is mainly a first quadrupole lens and on the side of said first electrode adjacent said second electrode a second elongated opening communicating with said first aperture, the longitudinal axis of said second opening being perpendicular to the longitudinal axis of said first opening so that said first electrode and said second electrode form a non-rotationally symmetrical multipole electron lens which is mainly a second quadrupole lens rotated 90° with respect to said first quadrupole lens.

4,242,614

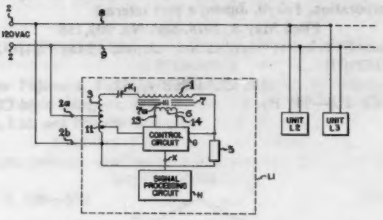
LIGHTING CONTROL SYSTEM

Dimitrios Vatis, East Flat Rock, and Charlie B. Turner, Hendersonville, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,077

Int. Cl.³ H05B *41/39*

U.S. Cl. 315—153 **11 Claims**



1. Lighting control system comprising, in combination, a plurality of gaseous discharge lamp loads connected in parallel, voltage supply means for said lamp loads, a plurality of variable impedance ballast means connected between said voltage supply means and each said lamp load, a plurality of control means respectively connected to said plurality of variable impedance ballast means for controlling the light level of said lamp loads, signal means for transmitting information signals, and a plurality of signal processing means arranged to receive information signals from said signal means and connected respectively to said plurality of control means for operating each said control means in response to the received information signals, said ballast means comprising a pair of inductively coupled coils, one of said coils arranged in series with said lamp load, the other of said coils connected to said control means for control of the current in said one coil.

4,242,615

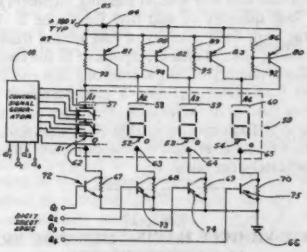
GAS DISCHARGE TUBE DRIVER AND LEVEL SHIFTER CIRCUIT

Alvin F. Kanda, Scottsdale, Ariz., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 811,025, Jun. 29, 1977, abandoned. This application Feb. 14, 1979, Ser. No. 12,173

Int. Cl.³ H05B *41/16*; G09G *3/10*

U.S. Cl. 315—169.1 **12 Claims**



1. In a gas discharge display apparatus including a plurality of cells connected for multiplex operation, each cell having an anode and at least two cathodes, the combination comprising:

a current-limiting device connected in series circuit relation with each of said cells to one of said at least two cathodes;

anode driver means coupled in circuit relation with each of said anodes;

means for sequentially shunting each of said current-limiting devices; and

means responsive to the shunting of a current-limiting device for energizing the anode driver means of another cell to vary the potential on the anode of said another cell.

4,242,616

PHOTOGRAPHIC FLASH APPARATUS

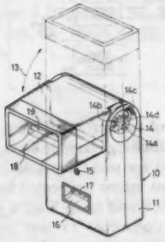
Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan, a part interest

Filed May 3, 1978, Ser. No. 902,755

Claims priority, application Japan, May 14, 1977, 52/61829[U]

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P **14 Claims**



1. A photographic flash apparatus comprising:

a flash housing consisting of a first casing having a first flashing member, wherein said first flashing member includes at least one first flash tube;

a second casing pivotably arranged with respect to said first casing and having a second flashing member, wherein said second flashing member includes at least one second flash tube; and

a flash control circuit for controlling the flashing of said first and second flashing members, wherein said flash control circuit includes an electric charge storing circuit having a main storage capacitor for supplying electrical energy to said first and second flashing members, a trigger pulse generating circuit for triggering said at least one first and at least one second flash tubes of said first and second flashing members, respectively, a flash tube circuit for generating a light flash and being connected to said at least one first flash tube and said at least one second flash tube, and a switching circuit for actuating said flash tube circuit, wherein said flash tube circuit includes flash light quantity control means for controlling the quantity of the light flash of said first and second flashing members so that the light flash quantity of said first flash tube is always less than the light flash quantity of said second flash tube, and flash timing control means responsive to the resultant total light flash quantity of said at least one first and at least one second flash tubes attaining a predetermined value for stopping flash of the at least one first flash tube and at least one second flash tube such that flash durations of the at least one first and at least one second flash tubes become approximately the same.

4,242,617

ELECTRIC VEHICLE HAVING DYNAMIC BRAKING AND REGENERATION

Marvin D. Jennings, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 764,776, Feb. 2, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 946,251

Int. Cl.³ H02K *7/10*

U.S. Cl. 318—13 **9 Claims**

1. A regenerative drive electric control system for use on an electric vehicle having ground engaging means including a traction wheel carried by an axle driven through a final drive gear, the improvement comprising;

an electric motor having an output shaft, said electric motor operating at a constant speed when energized;

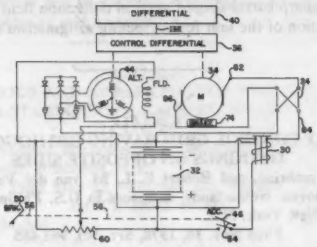
a motor brake for selectively preventing the rotation of said output shaft of said electric motor;

a mechanical brake for stopping said vehicle;

a battery source of electrical energy for supplying current to said electric motor;

an alternator having a variable resistance field and an input shaft, the input shaft torque load being directly increased with an increase in said variable resistance field, said alternator electrically connected to said battery to provide electrical energy to charge said battery;

an electrical current circuit including an on-off electrical switch, a vehicle direction selector having forward, neutral and reverse positions, a motor solenoid to control the passage of electrical current between said battery and said electric motor, a switch for activating said motor solenoid and a variable resistor for controlling said field of said alternator;



a control differential gearbox coupled to said motor, said alternator and said final drive gear for distributing a drive output of said electric motor, said drive including a zero output of said electric motor when said motor brake is engaged, to said alternator and to said final drive gear of said electric vehicle;

an accelerator pedal having a linkage for closing said electrical current circuit switch for activating said motor solenoid and for progressively adjusting said variable resistor to increase said field of said alternator whereby the resistance to motion of said alternator due to said increase in said field of said alternator results in an increased torque load to said control differential gearbox resulting in vehicle motion;

a brake pedal having a linkage for progressively increasing said field of said alternator through adjustment of said variable resistor and progressively applying said brake of said electric motor whereby regeneration of said battery by said alternator occurs when said brake of said electric motor is energized to prevent electric motor rotation and said vehicle is in motion.

4,242,618

SPEED CONTROLLER FOR ROTARY MACHINE

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 20, 1978, Ser. No. 870,982

Claims priority, application Japan, Jan. 25, 1977, 52-7479

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—314 **5 Claims**

1. A speed controller for a rotary machine comprising:

a speed detector for generating a first signal corresponding to the rotating speed of said rotary machine;

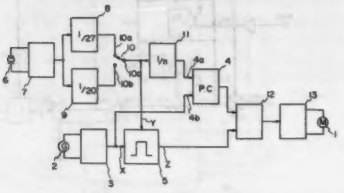
a reference frequency generator for generating a second signal having a controllable frequency;

a divider coupled to the output of said reference frequency

generator for developing a reference phase signal by dividing said output signal from said reference frequency generator;

a phase comparator for receiving said first signal from said speed detector and said reference phase signal from said divider and developing a comparison signal related to the phase difference therebetween;

synchronous pull-in circuit means, having a first control input coupled to said speed detector and a second control



input coupled to said reference frequency generator for developing a pull-in signal having a repetition period related to said first signal and an astable period related to said second signal;

a mixer for mixing said comparison signal from said phase comparator and said pull-in signal from said synchronous pull-in circuit means; and

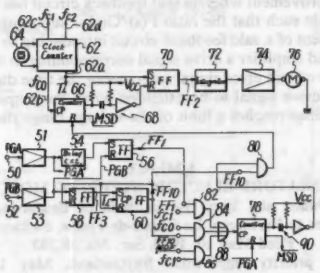
a means coupled to said mixer for driving said rotary machine responsive to the output of said mixer.

4,242,619

DIGITAL SERVO CONTROL CIRCUIT

Tadahiko Nakamura, and Kenji Nakano, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1979, Ser. No. 6,756
Claims priority, application Japan, Jan. 27, 1978, 53/74046
Int. Cl.³ H02P 5/16
U.S. Cl. 318—314 **25 Claims**



1. A servo control apparatus for controlling the rotation of a rotary member comprising:

drive means for rotating said rotary member;

means for generating first angular position signals related to a first angular position of said rotary member;

means for generating reference signals related to a second angular position of said rotary member;

at least some of said first angular position signals and said reference signals cyclically occurring in spaced pairs;

clock signal generating means for generating at least one clock signal comprised of repeated cycles having a predetermined frequency;

counter means for counting said cycles of said clock signal occurring in a time interval related to the time interval between said spaced pairs to produce a stored value therein;

means for clocking said counter means from said stored value to a predetermined value;

means for generating at least one pulse-width-modulated pulse having a width related to a time at which said counter means reaches said predetermined value; and

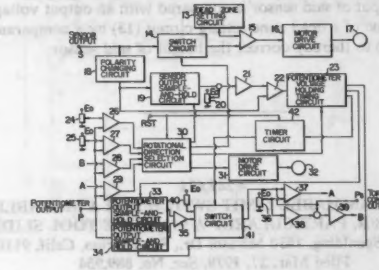
means for controlling said drive means in response to said pulse-width modulated pulse.

4,242,620

AUTOMATIC WELDING LINE TRACING METHOD AND APPARATUS

Osamu Fujiwara, Funabashi; Takeshi Araya, Shimoinayoshi, and Tsugio Udagawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Seiko Ltd., both of, Japan

Filed Jun. 22, 1978, Ser. No. 918,276
Claims priority, application Japan, Jun. 24, 1977, 52/74325
Int. Cl.³ G05B 19/33
U.S. Cl. 318—576 **1 Claim**



1. An automatic welding line tracing apparatus comprising:

a non-contact-type sensor for tracing a welding line;

a first moving base with a drive motor disposed to reciprocate said non-contact-type sensor in a direction normal to said groove of said plates at a predetermined height from upper surfaces of said plates;

a second moving base with a drive motor disposed to correct to a desired value the height of said non-contact-type sensor from said plates at each of two ends of said groove over said surfaces;

a position detector operatively associated with said non-contact-type sensor to detect the position thereof; and

a control unit whereby when said non-contact-type sensor is moved in said direction normal to said groove, a voltage representing a central position of said groove is generated through said position detector in response to variation in an output of said sensor wherein said control unit comprises a rotational direction selection circuit (**30**) disposed to receive signals applied through variable resistors (**24,25**) and comparators (**26, 27**) disposed to determine upper and lower limits to a oscillating amplitude of said sensor and signals applied from comparators (**28, 29**) disposed to determine an oscillating amplitude of said sensor for a trace operation to thereby determine a direction of oscillation of said sensor, a sample-and-hold circuit (**19**) responsive to a timing pulse output of said rotational direction selection circuit (**30**) to sample and hold the output of said sensor to produce voltages E_1 and E_2 respectively corresponding to the ends of said groove, a comparator (**22**) disposed to compare the output of said sensor with $E_1-\delta$ and $E_2-\delta$, respectively, a circuit (**23**) whereby when the output of said sensor agrees with said $E_1-\delta$ and $E_2-\delta$, respectively, a timing pulse for sampling and holding a potentiometer output P corresponding to a position of said sensor is generated, circuits (**33, 34**) each responsive to said timing pulse to sample and hold said potentiometer output P corresponding to a sensor

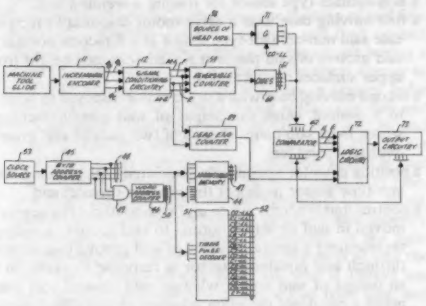
position, an amplifier circuit (35) disposed to increase by $\frac{1}{k}$ times an output of said circuits (33,34), respectively, a switch circuit (41) whereby when there is the generation of no sample-and-hold pulse for sampling and holding said potentiometer output corresponding to a sensor position, a timer circuit (42) is actuated in response to an output of said timing pulse generating circuit (23) to block the output of said amplifier circuit (35) for a predetermined time to thereby receive a separately established output of a reference voltage generating circuit (40), setting means (36) disposed to set the range of said sensor oscillating to a desired value in accordance with the output of said amplifier circuit (35), a circuit whereby a difference between an output of said switching circuit (41) and an output of said setting means (36) is applied as a reference voltage to said comparators (28, 29), respectively, to compare the same with said potentiometer output P to provide a proper oscillating amplitude and a circuit (16) whereby when said sensor is over said plates, a switch circuit (14) is brought into operation in response to a timing pulse signal from said rotational direction selection circuit (30) and the output of said sensor is compared with an output voltage value of a dead zone setting circuit (13) by a comparator (15) to thereby correct the height of said sensor.

4,242,621

PROGRAMMABLE LIMIT SWITCH FOR A MOVABLE MEMBER, PARTICULARLY A MACHINE TOOL SLIDE

Carl P. Spaulding, 1530 Mirasol Dr., San Marino, Calif. 91108

Filed Mar. 27, 1978, Ser. No. 889,934
Int. Cl.[3] G05B *19/29*
U.S. Cl. 318—601 25 Claims



1. A programmable limit switch for a movable member comprising:

means for generating a first digital signal representative of the position of the movable member;

a plurality of actuatable output switches;

means for storing a plurality of second digital signals each representative of a plurality of positions between an upper limit and a lower limit;

means for relating each second signal to one of the output switches;

means for comparing the first signal with the upper and lower limit of each of the plurality of second signals; and

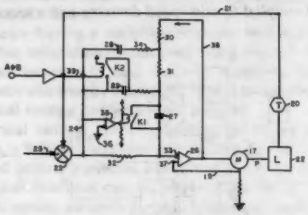
means responsive to the comparing means and the relating means for actuating the output switch related to one of the plurality of second signals, when the position represented by the first signal is between the upper and lower limits of such one of the plurality of second signals.

4,242,622

STABILIZED NON-LINEAR SERVOMECHANISM

Francis H. Shepard, Jr., Summit, N.J., assignor to R & I Patent Corporation, Morristown, N.J.

Filed May 14, 1979, Ser. No. 38,653
Int. Cl.[3] G05B *6/02*
U.S. Cl. 318—616 11 Claims



1. In a stabilized non-linear servomechanism arrangement, comprising:

a comparator for generating, at an output terminal thereof, an error signal corresponding to the difference between a first signal indicative of a desired position and a second signal indicative of the actual position of a movable element;

an operational amplifier having input and output terminals and a limited output voltage range for amplifying said error signal;

a motor coupled to said amplifier output terminal and driven by said amplifier, and a movable element driven by said motor;

transducer means coupled to said movable element for generating said second signals;

a negative feedback circuit interconnected between said operational amplifier output and input terminals and having a transfer function F(s) therebetween, where s is the Laplace transform parameter,

the output position to electrical input signal transfer function of said motor and any associated electrical and mechanical elements being G(s),

the improvement wherein said feedback circuit has a characteristic such that the ratio F(s)/G(s) is substantially independent of s, said feedback circuit introducing to the input of said amplifier a drive signal corresponding to the derivative of said error signal and causing the time duration of said drive signal to be extended when the output of said amplifier reaches a limit of the voltage range thereof.

4,242,623

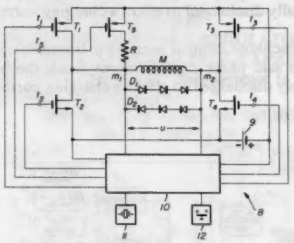
MINIATURE ELECTRIC STEPPING MOTOR

Claude Oudet, and Yves Guerin, both of Besancon, France, assignors to Portescap, La Chaux-de-Fonds, Switzerland

Filed May 10, 1979, Ser. No. 38,293
Claims priority, application Switzerland, May 12, 1978, 5175/78
Int. Cl.[3] G05B *19/40*
U.S. Cl. 318—696 6 Claims

1. A miniature electric stepping motor comprising a magnetized rotor, a stationary magnetic circuit having spaced polar parts defining an air gap, an electric excitation coil coupled to the stationary magnetic circuit, and a control device connected to the said excitation coil, means for mounting the magnetized rotor for rotation in said air gap so that its poles cooperate with the polar parts of the stationary magnetic circuit, the magnetization of the rotor and the form of the polar parts being such that the rotor has at least one stable, equilibrium position located so as to precede, with respect to a first direction of rotation, the position in which the torque due to a constant current through the coil would attain its maximum, the control device comprising means for applying to the excitation coil,

starting from each stable equilibrium position of the rotor, a control impulse having a first polarity, and having an amplitude and a width such that the rotor rotates in the said first direction of rotation until it reaches the next stable equilibrium position, and means for applying to the excitation coil, upon an external control, starting from each stable equilibrium position, first a pre-impulse of said first polarity and having an amplitude and a width such that the rotor rotates in the first direction of



rotation but cannot reach the next stable equilibrium position in this direction of rotation, and subsequently a control impulse in the reverse direction, having a polarity opposite to the said first polarity and an amplitude and width such that the rotor, after having reversed its direction of rotation, moves in the reverse direction of rotation until it reaches the stable equilibrium position following that at which the said pre-impulse has been applied.

4,242,624

DIRECT CURRENT STEPPER MOTOR WITH A PERMANENT MAGNET ROTOR AND ELECTRONIC COMMUTATION DEVICE

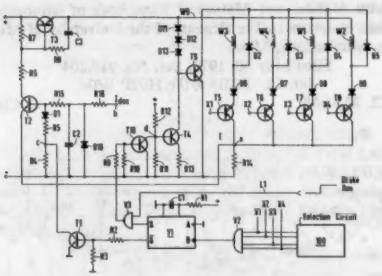
Karl Schalk, Nuremberg, and Georg Kögler, Schwabach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 22, 1978, Ser. No. 944,767

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1977, 2742932

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **9 Claims**



1. In a direct current stepper motor with a permanent magnet rotor and electronic commutating device, in which the individual winding circuits are addressed successively via a selector circuit and the current flowing in the winding circuits is regulated to a constant value by means of a current regulator, the improvement comprising:

(a) means to enable an additional braking moment during each positioning including means to take off the negative and/or positive EMF voltage and short said voltage comprising:

i. a coupling diode associated with each winding circuit, all coupling diodes being interconnected to a terminal; and

ii. a power transistor having a control input, said power transistor coupling said terminal to the power supply through its emitter collector path; and

(b) a time delay stage having its output coupled to said control input of said transistor.

4,242,625

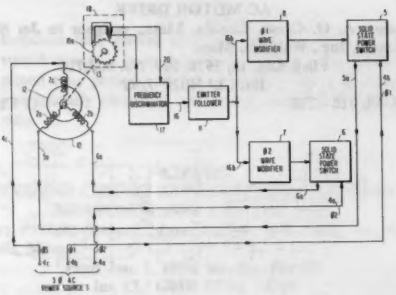
ENERGY ECONOMIZER FOR POLYPHASE INDUCTION MOTORS

Rhey W. Hedges, Ft. Lauderdale, Fla., assignor to Louis W. Parker, Fort Lauderdale, Fla.

Filed May 4, 1979, Ser. No. 35,974

Int. Cl.³ H02P *7/36*

U.S. Cl. 318—729 **20 Claims**



1. An energy economizing AC power control system operative to reduce the iron and copper losses in a conventional three phase AC induction motor by varying the form and magnitude of input voltage coupled thereto, comprising a conventional three phase AC induction motor having three stator windings and a rotor adapted to be coupled to a load, a three conductor three phase sine wave power source for energizing said stator windings to effect rotation of said rotor, and a conditionally closed loop positive feedback control means that becomes operative to control the energization of said stator windings from said power source by reference to a particular speed caused to be energy-efficient by properties inherent to induction motors during a limited range of motor speeds near the full speed of said motor, said closed loop positive feedback control means comprising: motor load detecting means coupled to said rotor and operative to produce a frequency modulated signal related to the load on said motor, frequency discriminator means coupled to said load detecting means for producing a DC control voltage which varies in magnitude in inverse relation to the speed of said motor, emitter-follower means coupled to the output of said frequency discriminator means to render said frequency discriminator means insensitive to variations of subsequent circuit means while coupling said DC control voltage to said subsequent circuit means, a plurality of voltage coupling means coupled to the output of said emitter-follower means for providing a plurality of DC control voltage outputs which are isolated from each other, two wave modifier means responsive respectively to said DC control voltage outputs and including associated switching means disposed between two conductors of said three phase power source and two of said three stator windings, the third stator winding being directly connected to the third conductor of said power source, said wave modifier means being operative to apply full sine waves of voltage from said power source to their associated stator windings during rotational start-up and speed build-up of said motor and, as said motor reaches said particular speed, then being operative to substantially maintain said particular speed by varying the

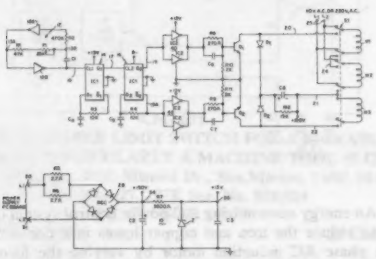
electrical angle of each cycle of said power source which is actually coupled to said two stator windings, and therefore to said third stator winding, thereby providing varying fractions of each sine wave of voltage from said power source to all three of said stator windings in accordance with the energy requirements imposed on said motor by the rotor load at any given moment and in accordance with the inherent electromechanical properties of said motor, whereby said closed loop positive feedback control means functions to substantially reduce the iron and copper losses of said conventional motor by causing the average current supplied from said power source to said stator windings to be supplied primarily as a function of the load on and properties inherent to said motor as the load of said motor varies between zero and maximum rated load.

4,242,626

AC MOTOR DRIVE

Thomas A. O. Gross, Lincoln, Mass., assignor to Jet Spray Cooler, Inc., Waltham, Mass.

Filed Aug. 15, 1978, Ser. No. 933,716
Int. Cl.³ H02P 7/42
U.S. Cl. 318—772 **11 Claims**



1. A motor drive circuit for driving the windings of an AC motor comprising;

clock means,

first and second semiconductor switch means each having at least a control electrode and first and second output electrodes,

means responsive to said clock means for generating cyclic signals for controlling the control electrodes respectively, of the semiconductor switch means,

load impedance means,

DC source means including means coupling to one side of the load impedance means and means coupling to the windings,

first and second unilateral conducting means coupling respectively, from the first output electrode of the first and second semiconductor switch means to the other side of the load impedance means.

and means coupling the semiconductor switch means to the motor windings.

4,242,627

BATTERY CHARGER

Edmund Kisiel, 7104 Thorncliffe Blvd., Parma, Ohio 44134

Filed Dec. 5, 1977, Ser. No. 857,101
Int. Cl.³ H02J 7/10
U.S. Cl. 320—21 **22 Claims**

1. A battery charging circuit comprising:

a source of rectified AC current;

terminals for connecting a battery to be charged in the circuit;

switching means actuable for transmitting current from said source to the battery in response to electrical pulses;

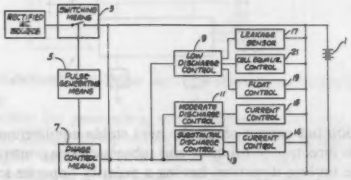
a control circuit for controlling the actuation of said switching means to control the amount of current transmitted by said switching means, said control circuit including:

pulse generating means actuable for generating pulses for actuating said switching means;

phase control means responsive to control signals for controlling the actuation of said pulse generating means to control the actuating of said switching means relative to said rectified AC current;

substantial discharge control means for transmitting control signals to said phase control means when the battery is substantially discharged to effect a charging current to the battery;

moderate discharge control means for transmitting control signals to said phase control means when the battery is moderately discharged to effect a charging current to the battery;



low discharge control means for transmitting control signals to said phase control means when the battery is slightly discharged to effect a charging current to the battery; and means for synchronizing said low, moderate and substantial discharge control means with the AC current;

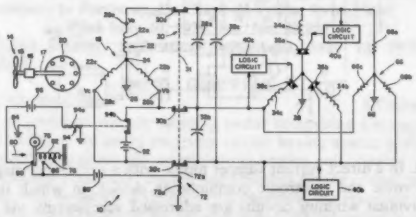
said low discharge control means, said moderate discharge control means and said substantial discharge control means being connected for actuation seriatim for controlling the charging of the battery, respectively, according to the voltage on the battery; the respective discharge control means including means for charging the battery in a continuous manner during the transition between the actuation of one of said discharge control means and the actuation of another of said control means for transmitting control signals to said phase control means.

4,242,628

WIND ENERGY CONVERSION SYSTEM

Narendra Mohan, and Mahmoud Riaz, both of Minneapolis, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 30, 1978, Ser. No. 910,204
Int. Cl.³ F03D 9/00; H02P 9/04
U.S. Cl. 322—35 **15 Claims**



1. A wind energy conversion system comprising a variable-speed wind turbine, an induction generator including a stator and a squirrel-cage rotor, said rotor being coupled to said turbine so as to rotate in accordance with the speed of said turbine, capacitor means connected to said stator for supplying excitation current to said generator, means for varying the amount of excitation current supplied by said capacitor means

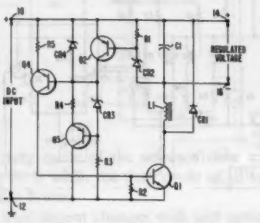
in accordance with the difference between the output voltage from said stator and a reference voltage, and an electrically isolated resistive load means of fixed resistive value connected to said stator and capacitor means, said resistive load means constituting a fixed resistance for heating purposes only which is substantially independent of the voltage generated by said generator and also substantially independent of the changes in frequency resulting from a relatively wide range of turbine speed changes caused by widely changing wind velocities.

4,242,629

DC SWITCHING VOLTAGE REGULATOR WITH EXTENDED INPUT VOLTAGE CAPABILITY

Kenneth C. Shuey, Cridersville, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 1, 1978, Ser. No. 965,553
Int. Cl.³ G05F *1/56*
U.S. Cl. 323—17 **4 Claims**



1. A direct current, high voltage, switching voltage regulator comprising: input terminals for receiving a DC voltage input that may vary over a range; output terminals for providing to a load a regulated DC voltage that remains substantially constant despite variation of said DC voltage input over said range; one of said output terminals being directly connected with the higher voltage one of said input terminals; first transistor means connected across said input terminals for initiating current flow through an energy storage inductor upon occurrence of an input voltage level of predetermined magnitude; said inductor being connected so voltage developed by its current is impressed upon said output terminals; second transistor means for terminating conduction of said first transistor means upon the voltage at said output terminals reaching a predetermined regulation voltage level; and third transistor means for acting as a current source that maintains said first transistor means in operation at low power dissipation over said input voltage range.

4,242,630

FERRORESONANT VOLTAGE REGULATOR INCORPORATING AUXILIARY WINDING FOR LARGE CURRENT MAGNITUDES OF SHORT DURATION

Bronislaw T. Szpakowski, Kanata, and Bruno DeGregorio, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

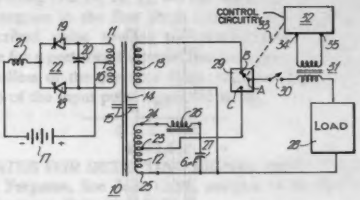
Filed Jul. 14, 1978, Ser. No. 924,636
Int. Cl.³ H02P *1/04*
U.S. Cl. 323—60 **11 Claims**

1. A voltage regulator for an alternating current (AC) load, said voltage regulator comprising:

a ferroresonant transformer having a primary winding for connection to a source of AC power, a secondary winding for selective connection to said AC load, an auxiliary winding for selective connection to said AC load whereby said auxiliary winding is closely coupled to said primary winding, and a capacitance means connected across a winding other than said primary or auxiliary windings;

a switch means for selectively connecting said auxiliary winding to said AC load for providing power to said load when said switch means is in a first state, and said switch means selectively connecting said secondary winding to said AC load for providing power to said load when said switch means is in a second state;

said switch means being responsive to the state of said load such that when said load is unenergized, and for a predetermined time period after said load is energized, said switch means is in its first state, and after said predetermined time period and for as long as said load remains continuously energized, said switch means is in its second state.

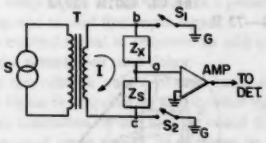


4,242,631

FRONT-END CIRCUIT APPARATUS FOR IMPEDANCE MEASUREMENTS AND THE LIKE

Henry P. Hall, Concord, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Jun. 1, 1978, Ser. No. 911,367
Int. Cl.³ G01R *27/02, 27/00*
U.S. Cl. 324—62 **10 Claims**



1. Front-end circuit apparatus for impedance measuring circuits and the like having, in combination, input ac coupling transformer means; unknown and standard impedance means sharing a common terminal of series-connection therebetween and with their other terminals connected to the transformer means; a pair of grounded switching means, one connected to each of the said other terminals of the respective unknown and standard impedance means; means for selectively switching each of the pair of switching means correspondingly to ground said other terminals; and isolating amplifier means having its input connected to the said common terminal and its output adapted for connection to detector means.

4,242,632

METHOD AND APPARATUS FOR TESTING AXIAL-LEAD COMPONENTS

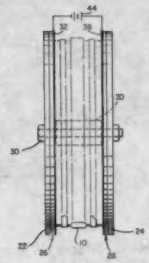
Robert A. Irvin, Sudbury, Mass., assignor to Semicon, Inc., Burlington, Mass.

Filed Sep. 11, 1978, Ser. No. 940,966
Int. Cl.³ G01R *31/02, 31/26*
U.S. Cl. 324—73 R **5 Claims**

1. Apparatus for the simultaneous testing of a plurality of electrical components, each of which has first and second axial leads, said apparatus comprising

a. first and second electrode assemblies having first and second spaced electrodes with substantially parallel, oppositely facing electrode surfaces, respectively;

b. means rendering at least the first electrode resilient;
c. means for positioning the components between the electrode surfaces;
d. means for urging said first electrode into contact with the ends of said first leads and said second electrode into contact with the ends of said second leads;



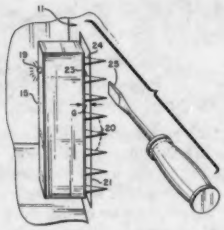
e. at least one of said electrodes being sufficiently thin that a failed component drawing excessive current therethrough will cause disintegration of said one electrode at the contact between said one electrode and a lead of said failed component, thereby disconnecting said failed component from said electrode.

4,242,633

INTEGRATED CIRCUIT LIGHT EMITTING ELECTRONIC MALFUNCTION CHECKING SYSTEM

Pierre L. Tissot, 863 Via de la Paz, Pacific Palisades, Calif. 90272

Filed Apr. 20, 1979, Ser. No. 31,948
Int. Cl.³ G01R *15/12*
U.S. Cl. 324—73 R **3 Claims**



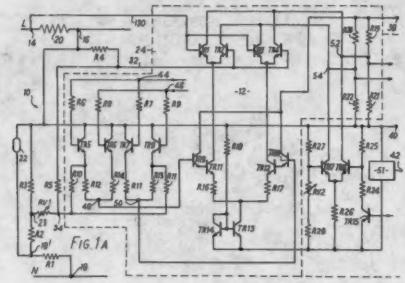
1. A serviceman's electronic malfunction checking system for an electronic chassis supporting a plurality of chips each containing micro-circuitry and connecting pins, in rows extending from one end of the chip to the other end, each of said plurality of chips further including:
(a) a normally de-energized light emitting diode visible from the exterior of the chip when energized;
(b) an amplifier circuit built into said chip and connected to said micro-circuitry in said chip, said amplifier circuit being biased to provide sufficient current to energize said light emitting diode only when connected thereto and only so long as said micro-circuitry is functioning normally; and
(c) specially selected first and second ones of said connecting pins respectively connecting to the output of said amplifier circuit and to said light emitting diode so that short circuiting of said first and second pins connects said light emitting diode to said amplifier circuit for energization thereby provided said sufficient current is present, whereby a serviceman can readily check for malfunctioning chips without having to remove the chip from said chassis by simply short circuiting said first and second connecting pins with a conducting probe and observing whether or not said light emitting diode is energized.

4,242,634

ELECTRONIC MULTIPLYING CIRCUITS

Eric Metcalf, Ropley, England, assignor to Enertec, Montrouge, France

Filed Apr. 13, 1979, Ser. No. 29,808
Claims priority, application United Kingdom, May 6, 1978, 18129/78
Int. Cl.³ G01R *21/06*
U.S. Cl. 324—142 **11 Claims**



1. An electronic multiplying circuit for multiplying together a first input signal and a second input signal, the multiplying circuit comprising:
a multiplier having a first input for receiving the first input signal, a second input, and an output;
an emitter-coupled pair of transistors, the collector of at least one of said transistors being coupled to the second input of the multiplier; and
a semiconductor switching circuit having an input for receiving the second input signal and first and second outputs coupled to the respective basis of said transistors, said switching circuit being operable to switch between first and second states in which the input of the switching circuit is alternately coupled to the respective bases of said transistors;
whereby, in operation, the magnitude of the signal applied by said emitter-coupled pair of transistors to the second input of the multiplier varies in dependence upon the second signal, and an output signal which varies in dependence upon the product of the first and second signals is produced at the output of the multiplier, the sense of the respective variations reversing with changes of the switching circuit between its first and second states.

4,242,635

APPARATUS AND METHOD FOR INTEGRATED CIRCUIT TEST ANALYSIS

Daniel J. Burns, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 26, 1979, Ser. No. 6,839
Int. Cl.³ G01R *31/22*
U.S. Cl. 324—158 R **2 Claims**

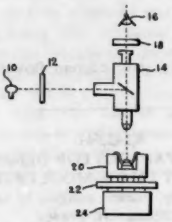
1. A method of testing an electrical circuit by observing birefringent changes in a layer of liquid crystals produced by electric fields in the liquid crystal which are induced by electric fields in the circuit during the operation of the circuit, said method comprising the steps of:
applying a layer of liquid crystals over said circuit with all of the liquid crystal molecules oriented in substantially the same direction,

placing a transparent coverplate over said layer of liquid crystals by depositing an electrically conductive, optically transparent layer upon the lower surface of the coverplate, and

forming an electrical contact from the lower surface to the upper surface of the coverplate,

directing a beam of light through said layer with an optical system adapted to make said birefringent changes visible,

energizing said circuit to produce said birefringent changes by sequencing the circuit through a number of logic states, pausing the logical sequencing at one or more selected states,



adjusting the duty cycle of the selected state or states to substantially 50% while the duty cycle of all other states is substantially lower,

recording the birefringent changes with said optical system,

adjusting the RMS electric fields appearing in the liquid crystal layer above selected conductor stripes by applying control signals to the electrical circuit with predetermined timing pauses therein to hold a selected state, and

observing said birefringent changes with said optical system, whereby the selected state birefringent changes may be observed or recorded.

4,242,636

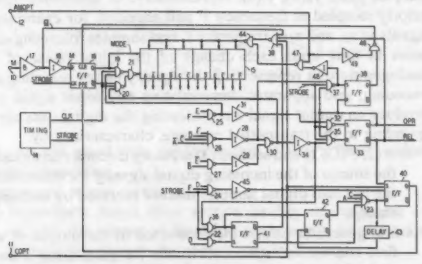
DIGITAL OPERATE/RELEASE TIMER

John L. Gilmer, Falls Church, Va., and Joseph F. Rizzo, Lodi, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 24, 1978, Ser. No. 954,179

Int. Cl.³ H03K *5/20*; H04G *1/36*; H04K *1/17*

U.S. Cl. 328—63 **9 Claims**



1. A timing circuit (the FIGURE) of the type employed to generate time delayed output pulse signals (OPR and REL) including an integrator (counter **15**) responsive to the presence (high state) of an input pulse signal (M at **10**) to integrate in a first sense, for example, a positive sense (count up), and to the absence (low state) of the input pulse signal (M at **10**) to integrate in a second sense, for example, a negative sense (count down), for generating an output change of state (OPR high and REL low) upon the integrator output (A-F) reaching a predetermined threshold value (for example a count of 48), CHARACTERIZED BY,

first means (**14, 16–24, 33, 40** etc.) responsive to the integrator (counter **15**) output (A, C, D, F) reaching a first prescribed value (for example a count of 13) in response to the presence of an input pulse signal (high state M at **10**) for controlling (via **16, 19, 21, 40**) the integrator (counter **15**) to integrate in the first sense (count up) from the first prescribed value toward the predetermined threshold value for a prescribed interval (for example a count of 40) regardless of the presence (high state) or absence (low state) of the input pulse signal (M at **10**).

4,242,637

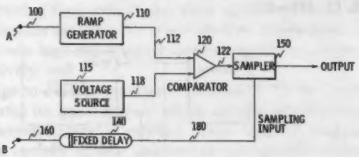
APPARATUS FOR DETECTING SIGNAL PRECEDENCE

Keith M. Ferguson, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1978, Ser. No. 957,386

Int. Cl.³ H03K *5/26*

U.S. Cl. 328—110 **6 Claims**



1. A method for determining the first to occur between first and second input signals at first and second points respectively, said method comprising the steps of:

providing a ramp signal which varies in a preselected manner in response to said first input signal;

providing a control signal in response to said second input signal and a preselected time delay;

determining the relative values of said ramp signal and a reference signal in response to said control signal; and

providing an indication of the first to occur between said first and second input signals in response to the relative values of said ramp signal and said reference signal.

4,242,638

CIRCUIT FOR MONITORING THE SQUARE OF THE RMS VALUE OF A PERIODIC SIGNAL

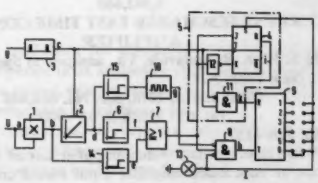
Helmut Glaser, Forchheim, and Ludwig Schick, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,513

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815089

Int. Cl.³ G01R *19/02, 21/06*; G06G *7/16*

U.S. Cl. 328—144 **8 Claims**



1. A circuit arrangement having a squarer and an integrator coupled thereto for monitoring the square of the RMS value of a periodic input signal coupled to said squarer comprising:

timing means supplying synchronizing pulses at intervals

separated by one period of the periodic input signal for resetting the integrator;

a first limit detector, coupled to the integrator, for generating a pulse when its limit is exceeded by the output signal of the integrator;

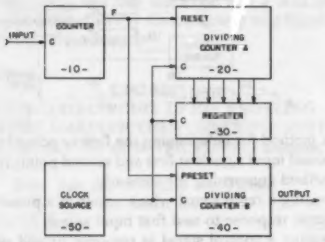
a counter, whose input is coupled to the limit detector via a first conjunctive logic element, for delivering, upon reaching a preset count, a continuous signal to an indicator for activating it and to the first conjunctive element; and

a gate circuit for feeding reset pulses to the reset input of the counter at the rate of the synchronizing pulses and for blocking delivery of the reset pulses so long as the first limit indicator delivers a pulse at every periodic time interval or when the preset count is reached in the counter.

4,242,639
DIGITAL PHASE LOCK CIRCUIT

James G. Boone, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 5, 1978, Ser. No. 939,762
Int. Cl.[2] H03B 3/04; H03K 5/18
U.S. Cl. 328—155 6 Claims



1. A phase lock circuit comprising:

means for providing an indication signal upon the occurrence of a predetermined number of transitions in an input signal;

means for providing a periodic signal;

first means for dividing the number of periodic signals occurring between successive indication signals by the number of predetermined transitions in the input signal to provide a quotient output signal;

second means for dividing the predetermined number of periodic signals by said quotient output signal to provide a periodic output signal having a frequency and phase corresponding to said input signal; and

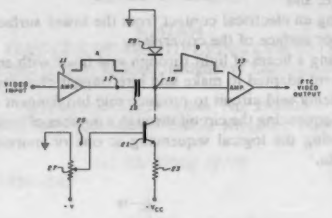
a holding register means interposed between said first and said second means for holding the quotient output signal from said first means for use by said second means, said holding register means adapted to reset upon receipt of said indication signal.

4,242,640
CURRENT DISCHARGE FAST TIME CONSTANT AMPLIFIER

Donald E. Bean, Ruckersville, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,445
Int. Cl.[2] H03K 3/02, 4/02
U.S. Cl. 328—187 4 Claims

1. A fast time constant video amplifier circuit comprising a low output impedance amplifier input means coupled to receive video pulses, a high input impedance amplifier output means for providing video output pulses to external circuits, a series capacitor having first and second terminals coupled between said input and output means respectively, a constant current source connected between said second terminal and a reference voltage, diode means for clamping said second terminal to ground potential at the termination of a video pulse, and

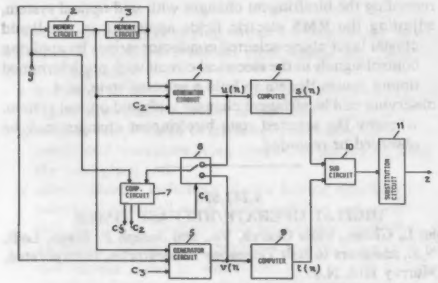


means to adjust the level of current flowing through said source.

4,242,641
METHODS AND APPARATUS FOR DEMODULATING A DIFFERENTIALLY PHASE-MODULATED SIGNAL

Jean P. Houdard, Orsay, France, assignor to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Apr. 4, 1979, Ser. No. 27,055
Claims priority, application France, Apr. 6, 1978, 78 10190
Int. Cl.[3] H03D 3/04
U.S. Cl. 329—126 16 Claims



11. Apparatus for demodulating a differentially phase-modulated digital input signal y comprising a series of digital samples $y_f(n)$, $y_k(n)$, $y_f(n)$, representative of sinusoidal signals priorly sampled at frequency F and encoded, for example, as signals x_f, s_k, and x_f of frequency f, said samples following each other in time upon each change of the initial phase of the analogue signal x representing the signal y before sampling and encoding, said apparatus demodulating said input signal y to produce an output signal z representing the digital data corresponding to the transmitted message, characterized by:

first (2; FIG. 1) and second (3) memory circuits connected to the source of the incoming digital signal y for memorizing the last two digital samples thereof received by said apparatus;

a first generator circuit (4) connected to the output of said first and second memory circuits for generating a series u(n) of digital samples of the series $x_k(n)$ from the samples stored in said first and second memories;

a first computing circuit (6) connected to the output of said first generator circuit for generating the series s(n) of the phases of the X_k sinusoidal signal digital samples of initial phase ϕ_k, from said series u(n);

a second generator circuit (5) connected to the output of said first and second memory circuits for generating a series V(n) of digital samples of the series $y_f(n)$ from the samples stored in said memories;

a second computing circuit (9) connected to the output of said second generator circuit for generating the series t(n) of the phases of the X_f sinusoidal signal digital samples of initial phase ϕ_f from said series v(n);

a comparison circuit (7) connected to said source of the incoming digital signal and to the outputs of said first and second generator circuits for comparing each digital sample of the input signal y with the digital sample of the same order number of one of said series u(n) and v(n);

a first switching circuit (8), connected to and controlled by an output from said comparison circuit, for switching on input to said comparison circuit between the output of said first generator circuit and said second generator circuit, depending upon the results of said comparison,

a subtracting circuit (10), connected to the outputs of said first and second computing circuits, for generating the phase difference between each term of the series of phases generated by said first computing circuit and the term having the same order number in the series of phases generated by said second computing circuit; and

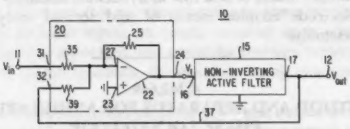
a substitution circuit connected to the output of said subtracting circuit and having stored therein a pre-determined law of correspondence for substituting for each phase difference generated by said subtracting circuit a group of bits in the output signal Z selected to represent this phase difference in accordance with said predetermined law.

4,242,642

POLE QUALITY FACTOR (Q) ENHANCEMENT TECHNIQUE FOR NOTCH FILTERS

Kenneth R. Laker, Staten Island, N.Y., and Jimmy Tow, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1979, Ser. No. 37,299
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—109 **15 Claims**



1. An enhanced pole quality factor Q notch filter section circuit comprising

input and output terminals,

a biquadratic notch filter section having an input and an output, the output of the biquadratic notch filter section being connected to the output terminal, and

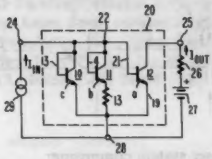
an enhancement amplifier having first and second inputs and an output, the first input of the amplifier being connected to the input terminal and the second input of the amplifier being connected to the output of the biquadratic notch filter section, the output of the enhancement amplifier being connected with the input of the biquadratic notch filter section for providing at the input of the biquadratic notch filter section negative feedback in pass and stop bands of frequencies and positive feedback in a transition range between the pass and stop bands of frequencies.

4,242,643

VARIABLE GAIN CURRENT AMPLIFIER

Arthur J. Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,366
Int. Cl.³ H03G *3/30*
U.S. Cl. 330—278 **12 Claims**



1. A current amplifier having input-current-dependent gain and comprising:

a current-to-voltage converter responsive to applied signal current for generating a control potential, the converter manifesting first, second and third signal current-to-voltage transfer functions for relatively low, intermediate and relatively high input signal current amplitude ranges respectively; and

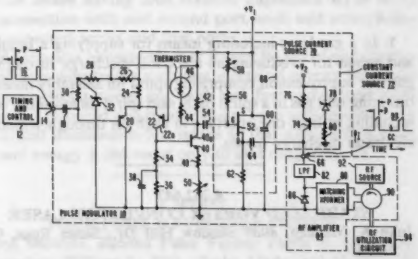
a voltage-to-current converter responsive to the control potential for providing an output current, which voltage-to-current converter exhibits output current related to signal current by first and second substantially constant factors respectively for the relatively low and relatively high amplitude ranges, and is variably related to signal current in the intermediate amplitude range.

4,242,644

PULSE MODULATOR FOR OPERATING A DEVICE IN THE AVALANCHE MODE

John O. Schroeder, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,390
Int. Cl.³ H03F *3/10, 3/60*
U.S. Cl. 330—297 **8 Claims**



1. A pulse modulator for applying power to a device for causing it to operate in its avalanche mode of operation with a desired power output, said device having a voltage breakdown threshold, comprising in combination:

a constant current source coupled to said device for providing thereto a current which causes said device to operate just at its voltage breakdown threshold; and

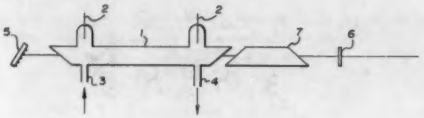
a source of pulse current also coupled to said device for producing periodic current pulses each of which, when added to said constant current, provides sufficient total current to provide the desired power output from said device.

4,242,645

GAS LASER SYSTEMS

Klaus J. Siemsen, Ottawa, and John Reid, Hamilton, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 22, 1977, Ser. No. 780,062
Int. Cl.³ H01S *3/223*
U.S. Cl. 331—94.5 G **4 Claims**



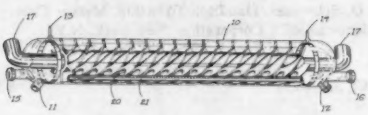
1. A gas laser system comprising:
- a resonant laser cavity;
- a discharge tube located within the laser cavity, said discharge tube containing a lasing gas selected from the group consisting of CO_2, an isotope of CO_2, N_2O, or an isotope of N_2O;
- pumping means within the discharge tube for energizing some of the molecules of the lasing gas to at least the 00°2 energy level; and
- a hot gas absorber cell located within the laser cavity, said hot gas absorber cell containing a gas identical to the lasing gas for absorbing the regular laser lines in emitted laser radiation allowing the lasing gas to lase in sequence laser lines.

4,242,646

SPIRAL FLOW CONVECTIVE LASER

John A. Macken, P.O. Box 696, Santa Rosa, Calif. 95402

Filed May 12, 1978, Ser. No. 905,186
Int. Cl.³ H01S *3/02, 3/045*
U.S. Cl. 331—94.5 D **8 Claims**



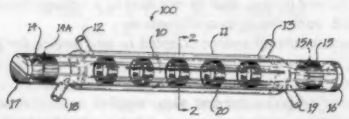
1. In a gas laser including means for supplying a lasing gas and means for producing an electrical discharge through said gas, the improvement comprising spiral fin assembly means for directing said gas in a spiral path, said spiral fin assembly means including at least one aperture in each fin through which said electrical discharge passes.

4,242,647

STABILIZED VORTEX CONVECTIVE LASER

John A. Macken, 4039 Shadow Hill Dr., Santa Rosa, Calif. 95404

Filed Oct. 27, 1978, Ser. No. 955,491
Int. Cl.³ H01S *3/03*
U.S. Cl. 331—94.5 D **7 Claims**



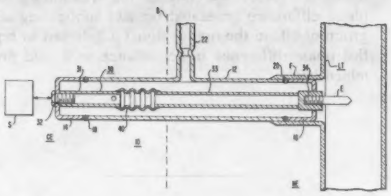
1. In a convective gas laser including gas discharge tube means for supplying a lasing gas and means for producing an electrical discharge through said gas, the improvement comprising;
- at least one fin ring disposed in said tube concentrically about the longitudinal axis of said tube and to the flow of said gas,
- said fin ring including at least two adjacent groups of upstanding fins which project into the interior of said tube,
- adjacent ones of said groups of upstanding fins oriented relative to each other and to said ring thereby to each produce a circumferential deflection angle to said laser gas as it flows through said tube.

4,242,648

HIGH POWER ELECTRODE AND FEEDTHROUGH ASSEMBLY FOR HIGH TEMPERATURE LASERS

Chi-sheng Liu, Monroeville; Donald W. Feldman, Pittsburgh; Roy K. Williams, Murrysville Borough, and Lelland A. Weaver, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1978, Ser. No. 974,579
Int. Cl.³ H01S *3/02*
U.S. Cl. 331—94.5 D **7 Claims**



1. In a high temperature laser, a feed-through assembly comprising:
- an open-ended elongated tubular quartz envelope,
- a first and second molybdenum assembly sealed to either end of said quartz envelope to seal off the enclosed volume of said quartz envelope, said first molybdenum assembly including an electrical contact means for connection to an electrical excitation source, said second molybdenum assembly including an electrode adapter means and
- a tubular electrical conductor means positioned within said quartz envelope and connected between said electrical contact means of said first molybdenum assembly and said electrode adapter means of said second molybdenum assembly.

4,242,649

METHOD AND APPARATUS FOR MODULATING A PHASE LOCKED LOOP

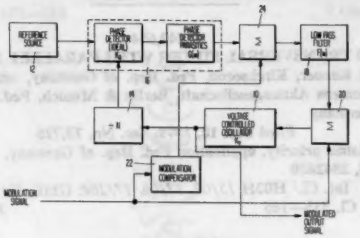
Clyde Washburn, Jr., Fairport, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 13, 1979, Ser. No. 57,281
Int. Cl.³ H03C *3/08, 3/09*
U.S. Cl. 332—18 **9 Claims**

1. A method of modulating a phase-locked loop to provide linear frequency modulation over an extended frequency range, said loop having a voltage controlled oscillator, a phase detector for comparing an output signal of the voltage controlled oscillator with a reference signal and for producing an output signal related to the difference in a component of the two compared signals, and a low-pass filter for processing the output signal of the phase detector and applying the processed signal as a control input signal to the voltage controlled oscillator to control the frequency of an output signal from said oscillator, said method comprising the steps of:
- providing a modulation signal;
- summing the modulation signal with the control input signal

to thereby directly apply the modulation signal to the voltage controlled oscillator as an input signal;

providing a summing junction in the phase-locked loop at a point located between the output terminal of the phase detector and the output terminal of the low-pass filter;



preshaping the modulation signal to compensate for the transfer function of ideal and any non-ideal loop circuitry located between the output terminal of the voltage controlled oscillator and the summing junction; and

applying the preshaped modulation signal to the summing junction to thereby add said preshaped modulation signal to the loop signal present at said summing junction.

4,242,650

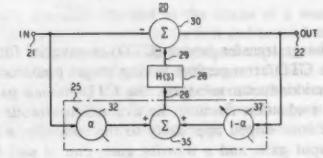
ACTIVE VARIABLE EQUALIZER

Robert R. Cordell, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1978, Ser. No. 959,451

Int. Cl.[3] H04B *3/14*

U.S. Cl. 333—28 R **6 Claims**



1. An active variable equalizer having an input terminal for receiving an input signal, an output terminal upon which an output signal is generated, and a transfer function between the input and output terminals, the equalizer being characterized by

a circuit interconnected with the input and output terminals for variably combining the input and output signals into an intermediate signal equal to a weighted sum of the input and output signals, wherein the intermediate signal is a sum of first and second components, the first component being a portion of the input signal, the second component being a portion of the output signal and wherein the portion of the input signal is proportional to a fraction less than unity and the portion of the output signal is proportional to a remainder of unity less the fraction,

a frequency dependent circuit having a transfer function proportional to H(s) and responsive to the intermediate signal for producing a frequency dependent additive feedforward signal and a negative feedback signal,

means for combining the input signal with the additive feedback signal and with the negative feedback signal into the output signal generated on the output terminal, and

the equalizer transfer function is proportional to an expression

$$\frac{1 + xF(s)}{x + F(s)},$$

wherein x is a ratio of the fraction to the remainder, $F(s)=H(s)+1$, and H(s) is independent of x.

4,242,651

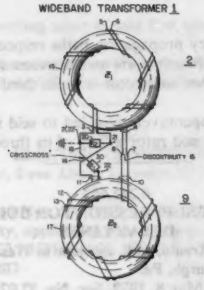
WIDEBAND TRANSFORMER APPARATUS

Suhash C. Dutta Roy, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 11, 1979, Ser. No. 47,295

Int. Cl.[3] H03H *7/38;* H01P *5/08*

U.S. Cl. 333—32 **10 Claims**



1. Electrical energy transfer apparatus comprising transmission line means having a first port and a second port, said transmission line means comprising a plurality of transmission lines respectively having different characteristic impedances, said transmission lines being connected together so that there is at least one partially reflecting characteristic impedance discontinuity formed by said transmission lines being connected together, each said discontinuity being located in said transmission line means between said first port and said second port; and

input circuit means and output circuit means, one of said circuit means having a total resistive impedance R_2 and being connected across said first port, the other said circuit means having total resistive impedance R_1 in series connection with said second port, with said series being connected across said first port,

said apparatus having values of R_1 and R_2 and of said characteristic impedances such that electrical energy from said input circuit passes into both said first and second ports and is reflected and transmitted at each said discontinuity in said transmission line means so that substantially all of said energy is delivered only to said output circuit.

4,242,652

FOUR PORT WAVEGUIDE SWITCH

Tsuneo Shishido, Rancho Palos Verdes; Philip A. Eyermann, Lawndale; William L. Vick, Yorba Linda, and Herman W. Cramm, Rolling Hills Estates, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 10, 1978, Ser. No. 922,895

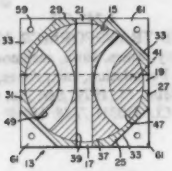
Int. Cl.[2] H01P *1/10*

U.S. Cl. 333—106 **5 Claims**

1. A four part waveguide switch comprising: a housing having a rotor-accepting cavity and first, second, third and fourth ports disposed therein;

a rotor disposed in said cavity and having first and second channels therein defining first and second orthogonal radio frequency propagation paths respectively between said first and third ports and between said second and fourth ports when said rotor is in its first rotor position,

said rotor also including third and fourth oppositely curved channels defining third and fourth curved radio frequency propagation paths respectively between said first and second ports and between said third and fourth ports when said rotor is in its second rotor position, said third and fourth curved paths also defining fifth and sixth



radio frequency propagation paths respectively between said first and fourth ports and between said second and third ports when said rotor is in its third rotor position; and

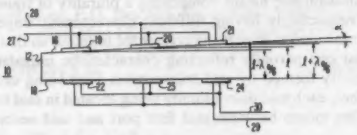
rotating means operatively coupled to said rotor for selectively moving said rotor to any of its three positions.

4,242,653

TRIPLE TRANSIT SUPPRESSION FOR BULK ACOUSTIC DELAY LINES

Robert A. Moore, Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 8, 1979, Ser. No. 37,070
Int. Cl.[2] H03H *9/30*; H01L *41/10*
U.S. Cl. 333—141 **2 Claims**



1. Electroacoustic apparatus for delaying signals and for providing wideband triple transit suppression about a predetermined center frequency comprising:

a substrate having an upper and lower surface, said substrate comprised of material suitable for propagating bulk acoustic waves,

a first transducer mounted on said upper surface for generating bulk acoustic waves toward said lower surface,

a second transducer mounted on said lower surface and positioned for receiving bulk acoustic waves from said first transducer and having a first acoustical path length from said first transducer to said second transducer,

a third transducer mounted on said upper surface for generating bulk acoustic waves toward said lower surface,

a fourth transducer mounted on said lower surface and positioned for receiving bulk acoustic waves from said third transducer and having a second acoustical path length from said third transducer to said fourth transducer;

a fifth transducer mounted on said upper surface for generating bulk acoustic waves toward said lower surface,

a sixth transducer mounted on said lower surface and positioned for receiving bulk acoustic waves from said fifth transducer and having a third acoustical path length from said fifth transducer to said sixth transducer,

said second acoustical path length being less than said first acoustical path length by one sixth wavelength of said predetermined center frequency, and

said third acoustic path length being greater than said first acoustical path length by one sixth wavelength of said predetermined center frequency,

means for coupling an input signal to said first, third and fifth transducer and

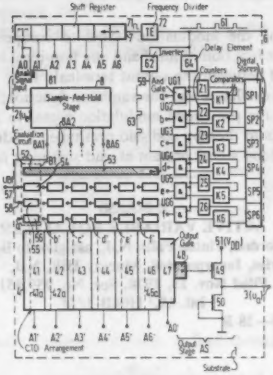
means for coupling an output signal from said second, fourth, and sixth transducer.

4,242,654

CTD TRANSVERSAL FILTER WITH PARALLEL INPUTS

Karl Knauer, Kirchseeon, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 73,726
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842630
Int. Cl.[3] H03H *15/02, 17/06, 17/284*; G11C *19/28*
U.S. Cl. 333—165 **8 Claims**



1. A charge transfer device (CTD) transversal filter, comprising: a CTD arrangement having stages constructed on a doped semiconductor substrate, the CTD having parallel inputs and evaluation circuits; the evaluation circuits each including a zone doped oppositely to the substrate, a first and second input gate, and a transfer gate; one of said first and second input gates being supplied with an input signal, the other of said first and second input gates being supplied with a constant D.C. voltage, the oppositely doped zone being supplied with a first clock voltage, and the transfer gate being supplied with a second clock voltage; the CTD arrangement also having an output stage at which a filtered output signal is tapped; comparators whose first inputs are connected to counter signals generated by counters supplied with a third clock voltage, whose second inputs are connected to digital signals generated by digital stores, and outputs of the comparators being connected to gate circuit means for blocking the evaluation circuits with respect to one of the supplied clock voltages in dependence upon a comparison between said counter signals and said digital signals; each of the stages of the CTD arrangement having its transfer electrode connected to a respective output of a respective stage of a shift register means for circulating an individual item of logic information therein in dependence upon a fourth clock voltage; and the shift register means creating at the output of the shift register stage containing this item of logic information, a first output voltage for transferring charge between the transfer electrode with which it is connected and an adjacent transfer electrode, the shift register means providing output voltages through the other shift register stage outputs for the storage of charge beneath those transfer electrodes to which they are connected which are not participating in said transfer of charge.

4,242,655

RF CONNECTOR ASSEMBLY WITH LOW FREQUENCY ISOLATION

David J. Carlson, and John P. Yu, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,781
Int. Cl.³ H01R *17/10*
U.S. Cl. 333—183 **7 Claims**

7. An RF connector assembly adapted for use with a utilization device, said assembly having an inner conductor, and, an outer electrical conductor defined by a tube-like housing, said housing being coaxial with said inner conductor, and being threaded along the axial direction, said assembly being adapted for mounting on a wall of said utilization device through a hole in said wall; said assembly comprising:

an insulating bushing having a sleeve member fitted over at last a portion of said tube-like housing; said bushing having a surface disposed perpendicularly with respect to said axial direction adapted for bearing upon one side of said wall, said member being adapted for passing through said hole;

a ceramic capacitor formed in the shape of a washer and having conductive material on first and second major flat surfaces thereof, said washer shaped capacitor having a center hole with a diameter sufficient to fit said capacitor over said housing and said sleeve member, said conductive material on said first flat surface of said capacitor being adapted for electrical contact with the other side of said wall;

a conductive washer having a center hole sufficient for fitting over said housing, said conductive washer being brought into electrical contact with said conductive coating on said second flat surface of said capacitor;

a lock washer having a center hole sufficient for fitting over said housing, said lock washer bearing against said conductive washer;

a nut threaded onto said housing and bearing upon said lock washer, said nut adapted for securing said assembly to said wall when tightened.

4,242,656

CURRENT PUMPED VOLTAGE DIVIDED ABSORBOR

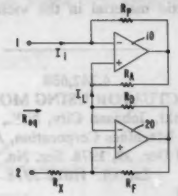
Robert L. Forward, Oxnard, and Dale M. Sipma, Sherman Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 8, 1979, Ser. No. 46,746
Int. Cl.³ H03H *11/46, 11/54*
U.S. Cl. 333—213 **4 Claims**

1. A circuit arrangement having first and second terminals comprising, in combination:

a first differential-input operational amplifier having a negative feedback resistor R_D and a positive feedback resistor R_A connected between the output and inputs thereof, said first operational amplifier being disposed so that the inverting input thereof is connected to said first terminal;

a second differential-input operational amplifier having a negative feedback resistor R_D and a positive feedback resistor R_F connected between the output and inputs thereof, said second operational amplifier being disposed so that the inverting input thereof is connected directly to



the non-inverting input of said first operational amplifier; and

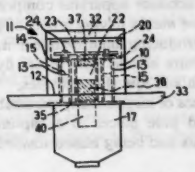
means for connecting the non-inverting input of said second operational amplifier to said second terminal.

4,242,657

ELECTRIC CONNECTOR

Gustave Chaillot, 8 rue Alsace Lorraine, 92 Boulogne sur Seine, France

Filed Nov. 17, 1978, Ser. No. 961,727
Claims priority, application France, Aug. 2, 1978, 78 22791
Int. Cl.³ H01H *9/00;* **H01R** *11/30, 33/30*
U.S. Cl. 335—207 **6 Claims**



1. An improved electric connector of the type including

a female tapping socket having at least one jack,

a male plug assembly for coupling to said tapping socket and having a plug element electrically engageable with said jack,

a movable member having a contact element located thereon, said movable member being movably mounted in said tapping socket for movement between an operative position wherein said contact element is in electrical contact with said jack and an inoperative position wherein said contact element is spaced from said jack and thereby not in electrical contact therewith,

terminal means located on said tapping socket for receiving electrical power,

means for electrically connecting said terminal means to said contact element,

magnetic actuating means for magnetically moving said movable member to said operative position upon the coupling of said plug assembly to said tapping socket and for magnetically holding said movable member in said operative position while said plug assembly and said tapping socket remain coupled,

magnetic biasing means located in said tapping socket for magnetically moving said movable member to said inoperative position upon the uncoupling of said male plug assembly from said tapping socket,

said movable member including magnetic material therein for attraction by said magnetic actuating means and said magnetic biasing means,

wherein said improvement comprises said magnetic material being substantially non-remanent for preventing said mag-

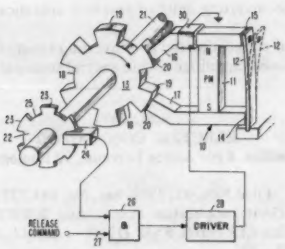
netic material from being magnetized or becoming magnetized by prolonged magnetic influence from either said actuating means or said biasing means and thus being or becoming capable of moving said movable member to said operative position by magnetic attraction to any unmagnetized magnetic material in the vicinity of said tapping socket.

4,242,658

MAGNETIC ACTUATOR USING MODULATED FLUX

Edward F. Helinski, Johnson City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,297
Int. Cl.³ H01F *7/18*
U.S. Cl. 335—237 **11 Claims**



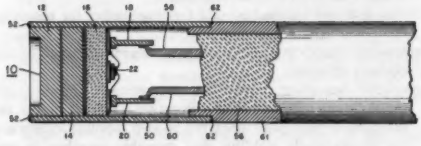
1. Magnetic actuator apparatus comprising, in combination:
magnetic core means having a pair of pole pieces;
means for producing unidirectional magnetic flux in said core structure at said pole pieces cyclically varying between high and low flux densities;
actuator means of magnetically permeable material attracted across said pole pieces in a captured position by said varying flux and being biased toward a released position; and
means selectively operable when said varying flux is less than said high density for further reducing said magnetic flux to a level permitting release of said actuator means.

4,242,659

THIN FILM RESISTANCE THERMOMETER DETECTOR PROBE ASSEMBLY

Ronald D. Baxter, and Paul J. Freud, both of Furlong, Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 15, 1979, Ser. No. 84,942
Int. Cl.³ H01C *7/00*; G01K *3/00*
U.S. Cl. 338—28 **7 Claims**



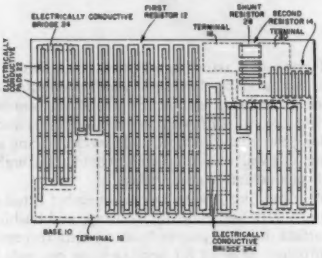
1. A resistance thermometer detector probe comprising:
a cylindrical sleeve;
insulator means for carrying leads through said sleeve;
a header mounted in the end of said sleeve, said header including
a first button of thermally conductive material;
a second button of a soft metal having a high thermal conductivity and a high diffusivity;
a third button of insulating material;
means for joining said buttons so that said second button is sandwiched between the first and third buttons with good thermal contact therebetween;
thick film deposits on the exposed surface of said third button, one of said deposits being in the center region of the surface and two other deposits being located in flanking relationship to the center region;
a thin film resistance thermometer chip affixed to said center region;
connectors for providing connection of said leads with the respective flanking regions; and
means for electrically connecting said resistance thermometer between said flanking regions.

4,242,660

THICK FILM RESISTORS

Theodore F. Cocca, Everett, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 8, 1979, Ser. No. 37,201
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—195 **4 Claims**



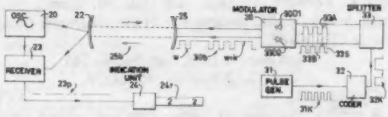
1. A thick film resistor disposed on a substrate between a first and a second terminal, such resistor comprising:
(a) a plurality of similarly shaped electrically conductive pads disposed on the substrate at equal distances between the first and the second terminal; and
(b) a thick film resistor in the shape of a strip on the substrate interconnecting the first and the second terminals, such resistor overlying each one of the plurality of similarly shaped electrically conductive pads.

4,242,661

DEVICE FOR REGISTRATION OF OBJECTS

Bengt T. Henoch, Skarholmen, and Eilert Berglind, Bandhagen, both of Sweden, assignors to Stifelsen Institutet for Mikrovagsteknik Vid Tekniska Hogskolan i Stockholm, Stockholm, Sweden

Filed Mar. 16, 1976, Ser. No. 667,306
Claims priority, application Sweden, Mar. 27, 1975, 7503620; Jan. 12, 1976, 7600204
Int. Cl.³ G08G *1/00*; G01S *13/74*; H03C *3/00*
U.S. Cl. 340—23 **31 Claims**



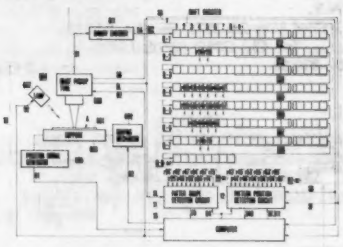
1. A device for registration of a first type of objects, here called registration objects, which move relative to a second type of objects, here called registration places, which registration objects, for example, may be vehicles, and the registration places may be places along a road section passed by the vehicles, which device comprises a plurality of recording units

attached one in each registration place or on each registration object, and a plurality of registration transceivers attached one on each registration object or in each registration place, and each recording unit comprising an emitter (20), a receiver (23) and an indication unit (24), and each registration transceiver comprising (a) a frequency converter for converting a first signal received from said emitter to a second signal without adding new energy to the signal, which second signal is frequency shifted by a certain amount relative to the first signal, (b) a coding device to provide said second signal with a code individual for the registration transceiver and (c) an emitter device for emitting said second coded signal, said receiver of the recording unit being adapted to receive said second signal, and its indication unit being adapted to indicate said code, characterized in that said frequency converter comprises a modulator, which modulates the first signal in such a manner, that at least one sideband frequency component is formed, and that the coding device is adapted to provide the frequency component with said code individual for the registration transceiver, preferably by starting and stopping said modulator in accordance with a pattern constituting said code.

4,242,662
METHOD AND APPARATUS FOR PATTERN EXAMINATION

Bunjiro Tsujiyama, Musashino; Kunio Saito, and Kenji Kurihara, both of Tokorozawa, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Japan

Filed Mar. 30, 1979, Ser. No. 25,447
Claims priority, application Japan, Oct. 16, 1978, 53-127654
Int. Cl.³ G06K 9/32
U.S. Cl. 340—146.3 H **8 Claims**

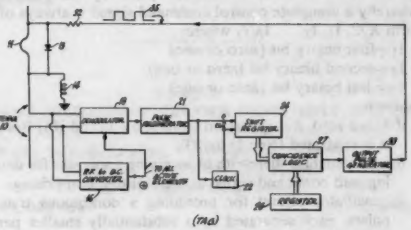


1. A method of examining a pattern comprising the steps of:
(a) detecting a pattern to be examined in accordance with regions of the pattern corresponding to picture elements on scanning lines of a sensor to produce binary video signals respctively from said regions;
(b) memorizing as parallel information the binary video signals in P shift registers having each Q memory elements, said P shift registers being connected in series via delay circuits each consisting of N-Q memory elements, where N is the number of picture elements on one scanning line, $Q<N$ and $P<N$;
(c) fetching said parallel information for logically processing the same so as to generate examination outputs pertaining to the shape and position of the pattern to be examined, said examination output pertaining to the position of the pattern to be examined including examination outputs concerning vertical and horizontal edges of the pattern; and
(d) judging the existence of a horizontal edge when defective pattern position data on the basis of detection of vertical edges is obtained from successive scanning lines of less than a predetermined number.

4,242,663
ELECTRONIC IDENTIFICATION SYSTEM

Leo Slobodin, Holmdel, N.J., assignor to Lockheed Electronics Corporation, Plainfield, N.J.

Filed Feb. 1, 1979, Ser. No. 8,798
Int. Cl.³ H04Q 9/00; G01S 9/56
U.S. Cl. 340—152 T **13 Claims**

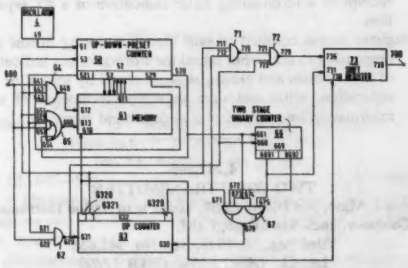


1. In combination in electronic identification apparatus, transceiver means including means for emitting a carrier modulated with a digital word, means for recovering a reflected signal of like frequency, and means for processing said recovered like frequency signal to determine the incidence of a tag-signalling amplitude variation therein, and at least one tag circuit means, said tag circuit means including an antenna, register means for storing a tag encoding, demodulator means connected to said antenna for recovering said modulated digital word, controlled means for selectively varying the electrical length of said antenna comprising selectively conductive means connected in parallel with a section of said antenna, and means connected to said demodulator means and said register means responsive to a match between the incoming demodulated digital word and the encoding contents of said register means for signalling said control means to vary said antenna electrical length comprising means for turning on said selectively conductive means responsive to the output of said match responsive means.

4,242,664
REMOTE CONTROL ARRANGEMENT

Guenter Lindstedt, and Wilfried W. Gehrig, both of Freiburg, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 11, 1978, Ser. No. 933,014
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737467
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—168 S **4 Claims**



1. In a remote control system of the type including a transmitter capable of transmitting a digital control command signal comprising a predetermined number of pulses, each indicative of a binary one or a binary zero, with a binary one manifesting a separation from a successive pulse of a fixed period 2T, with

a binary zero manifesting a separation from a successive pulse of a fixed period T, said control signal always of a given pattern as starting with a start pulse X, a first command pulse C always following said X pulse by the period T with a fixed number of information pulses indicative of binary ones and zeroes, as determined by said fixed period separation, following said first command pulse, with a terminating end pulse Y spaced from said last information pulse by the period 3T, whereby a complete control command signal is always of the form X,C, I_1, I_2 . . . I_NY, where:

I_1=first binary bit (zero or one)

I_2=second binary bit (zero or one)

I_N=last binary bit (zero or one)

wherein:

if I_1 is a zero, it is separated from I_2 by T, and if I_1 is a one, it is separated from I_2 by 2T,

the combination therewith of receiving apparatus for detecting said command signal as transmitted, comprising:

an oscillator circuit for providing a continuous train of pulses, each separated by a substantially smaller period than said fixed period T, with said pulse train at a given random frequency with respect to said command signal,

an up-down counting means responsive to said continuous train of pulses for counting said pulses in an up direction in a first mode and a down direction in a second mode,

first logic means coupled to said counter and responsive to said start pulse X for causing said up counter to commence counting said train of pulses in said first mode,

memory means coupled to said up-down counter and operative to store said count upon receipt of a control signal,

second logic means coupled to said memory means and responsive to said first command pulse C to provide said control signal to cause said memory to store said count indicative of a given number of pulses emanating from said oscillator during the period T as separating said X pulse from said first command pulse C, said logic means including means for coupling said control signal to said up-down counter to cause said counter to commence counting in said second mode,

zero detecting means coupled to said up-down counter and operative to decode an all zero state indicative of said counter counting down said period T, said detecting means including means for transferring said count as stored in said memory to said up-down counter to again cause said counter to count down from said stored count,

binary counting means coupled to said zero detecting means and responsive to said input signal to provide an output indicative of the number of all zero states manifested by said up-down counter between successive pulses of said command signal, whereby a count of one manifests the receipt of a binary zero indicative of a T pulse separation, a count of two manifests the receipt of a binary one indicative of a 2T pulse separation and a count of three manifests receipt of a terminating pulse indicative of a 3T separation,

register means coupled to said binary counting means and responsive to said input signal for storing values indicative of binary ones and zeroes as determined by said T or 2T separation, with said data as stored indicative of said information bits of said digital command signal.

4,242,665

TWO-WIRE TRANSMITTER

David J. Mate, San Diego, Calif., assignor to Action Instruments Company, Inc., San Diego, Calif.

Filed Sep. 15, 1978, Ser. No. 942,638

Int. Cl.[3] G08C *19/04;* **G01R** *27/00*

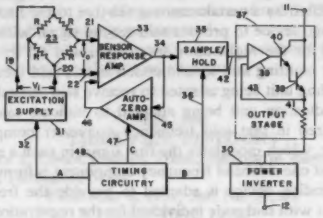
U.S. Cl. 340—870.38 **10 Claims**

1. A two-wire transmitter for tramsitting information via a pair of wires having an external power supply connected thereto, said transmitter comprising;

means for receiving a predetermined amount of power via said pair of wires from said external power supply;

means for storing a portion of said received power during spaced apart first time intervals;

means for exciting an external sensor with said stored power during second tie intervals that are substantially shorter than said first time intervals and are spaced between respective ones of said first time intervals;



means for sampling and holding the excitation output of said sensor in synchronization with said excitation thereof; and

variable resistance means for insertion in series with said pairs of wires and responsive to said held excitation output from said sensor to allow a current representative thereof to flow through said pairs of wires.

4,242,666

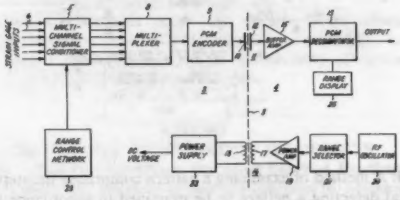
RANGE SELECTABLE CONTACTLESS DATA ACQUISITION SYSTEM FOR ROTATING MACHINERY

John M. Reschovsky, Schenectady, and Gerald P. Hunt, Cohoes, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 23, 1979, Ser. No. 41,725

Int. Cl.[3] G08C *19/16, 15/06*

U.S. Cl. 340—870.28 **8 Claims**



1. In combination with apparatus having a stationary member and a rotational member or rotor adapted to rotate at high speed within said stationary member, a multichannel data acquisition system for acquiring physical measurement data on parts of said rotational member comprising:

a data collection-transmission portion mounted on and rotatable with said rotational member, said data collection-transmission portion including means to provide a composite digital data signal containing said physical measurement data;

a stationary data reception portion adapted to receive said composite digital data signal, said data reception portion having means for generating an RF signal;

means for inductively coupling said RF signal from said stationary portion to said data collection-transmission portion to provide operating power to said data collection-transmission portion; and,

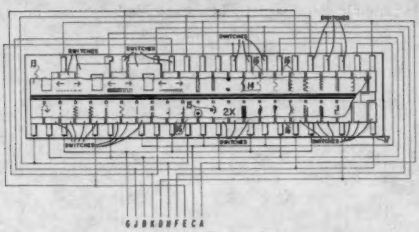
means for capacitively coupling said composite digital data signal from said data collection-transmission portion to said stationary portion.

4,242,667

HIGH DENSITY PROXIMITY SWITCH ARRANGEMENT

Barney D. Hunts, Mountain Lakes, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 31, 1978, Ser. No. 938,626
Int. Cl.[3] G06F *3/02;* D05B *3/00*
U.S. Cl. 340—365 R 2 Claims



1. A control panel for an appliance having a multiplicity of operating capabilities, functions and conditions, said control panel comprising:

means for presenting to an operator of said appliance indicia representative of said operating capabilities, functions and conditions of said appliance;

a plurality of switch devices which are interconnected in several groups and arranged with respect to said presenting means so as to have a switch device from a different switch group on each side of each indicium of said indicia, with adjacent indicia sharing a switch device, thereby to provide a unique pair of switch groups for each indicium of said indicia;

means for determining the actuation of any pair of said switch groups; and,

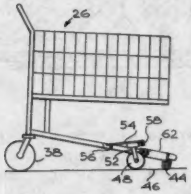
means for decoding the specific operating capability, function and condition selected by actuation of said any pair of said switch groups.

4,242,668

CART THEFT PREVENTION SYSTEM

Walter Herzog, 20338 Bryant St., Canoga Park, Calif. 91306

Filed Apr. 30, 1979, Ser. No. 28,042
Int. Cl.[3] G08B *1/08;* B60R *25/08;* B62D *39/00*
U.S. Cl. 340—539 14 Claims



1. An improved cart theft prevention system, said system comprising, in combination:

a. signal sending means; and

b. at least one cart having a signal receiving means secured thereto which is adapted to receive a signal from said sending means while at a distance therefrom, said cart comprising, in combination:

i. a frame adapted to support and contain a load,

ii. a sub-frame adjacent said frame and bearing spaced cart-supporting wheels,

iii. pivot means pivotally securing one end of said sub-frame to said frame, and

iiii. latch means spaced from said pivot means, secured to said frame and sub-frame and releasably securing said sub-frame to said frame.

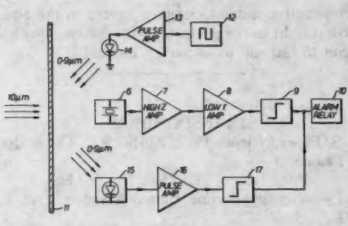
c. said signal receiving means on said cart connected to said latch means and responsive to a signal from said signal sending means, said signal controlling movement of said latch means so as to enable movement of the sub-frame and the wheels on said sub-frame into a cart-immobilizing position.

4,242,669

PASSIVE INFRARED INTRUDER DETECTION SYSTEM

David W. Crick, West Molesey, England, assignor to B. A. Security Systems Limited, West Molesey, England

Filed May 4, 1979, Ser. No. 35,844
Int. Cl.[3] G08B *13/18, 29/00*
U.S. Cl. 340—567 9 Claims



1. Radiation detection apparatus, comprising

(a) first detector means (6–9) for detecting radiation of a first wavelength emitted by a radiation source;

(b) indicating means (10) connected with said first detector means and operable when the detected radiation exceeds a first level; and

(c) reflection-responsive means operable when an obturating element (11) is positioned between the radiation source and said first detector means, said second indicating means including

(1) transmitter means (14) adjacent said first detector means for transmitting a signal of a second wavelength in the general direction of the radiation source; and

(2) second detector means (15–17) adjacent said first detector means for detecting the signal of second wavelength when reflected from said obturating element (11) for operating an indicating means when the level of the reflected signal received by said second detector means exceeds a second level.

4,242,670

PHOTOSENSITIVE ALARM SYSTEMS

William V. Smith, 1617 Duke St., Memphis, Tenn. 38112

Filed Mar. 2, 1979, Ser. No. 17,148
Int. Cl.[3] G08B *13/08, 13/18*
U.S. Cl. 340—568 22 Claims

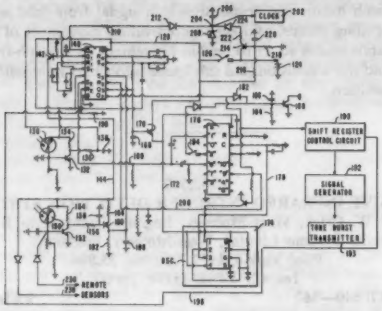
1. A photosensitive alarm system for detecting unauthorized intrusions into a protected area normally unexposed to ambient light, comprising:

a photosensitive trigger circuit operable upon exposure of the protected area to ambient light for generating a trigger signal;

a gate circuit coupled to said photosensitive trigger circuit for producing a control signal in response to the said trigger signal;

a warning circuit coupled to said gate circuit for producing

an alarm signal in response to said control signal to indicate detection of an intrusion into the protected area; and



a photosensitive arming circuit operable in the absence of ambient light in the protected area for enabling said gate circuit to respond to said trigger signal.

4,242,671

TRANSPONDERS

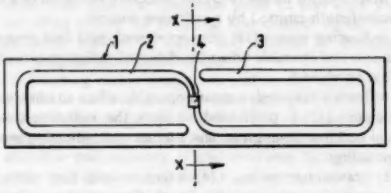
Graham S. Plows, Science Park, Milton Rd., Cambridge, CB4, 4BN, England

Filed Dec. 8, 1978, Ser. No. 967,569

Claims priority, application United Kingdom, Dec. 9, 1977, 51445/77

Int. Cl.³ G08B *13/24*

U.S. Cl. 340—572 **3 Claims**



1. A passive transponder tag comprising

a flexible substrate;

at least one antenna disposed on said substrate for the reception and retransmission of electromagnetic wave energy;

a member including a body of piezoelectric material disposed on said substrate and connected to said antenna and adapted to convert received electromagnetic energy into an acoustic surface wave and to convert the acoustic wave into electromagnetic energy for retransmission by said antenna; and

means defining a recess between said member and said substrate for permitting a surface of the piezoelectric material to remain free for the propagation and sustaining of the acoustic surface wave.

4,242,672

PATIENT MONITORING SYSTEM AND SWITCH

Robert L. Gault, 140 Gilman St., Garden City, Mich. 48135

Filed Nov. 9, 1977, Ser. No. 849,809

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—573 **9 Claims**

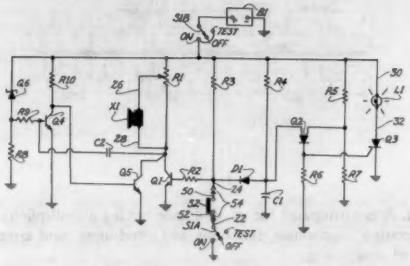
1. Patient monitoring apparatus for signaling patient egress from an object of patient occupancy, such as a bed, chair, or the like, comprising:

switch means associated with said object selectively operable to a first state when said object is occupied and to a second state when said object is unoccupied;

an audible alarm for providing an audible alarm signal;

a visual alarm for providing a visual alarm signal; and

circuit means operatively coupling said switch means and said audible alarm and visual alarm effective to cause said audible alarm to give said audible alarm signal when said switch means is in its second state and to not give said audible alarm signal when said switch means is in its first



state, and including time delay circuit means effective to cause said visual alarm signal to be given in predetermined time delayed relationship to the operation of said switch means to its second state from its first state only if said switch means is continuously maintained in its second state for the duration of the predetermined time delay, said circuit means being further effective to cause said visual alarm to continue giving said visual alarm signal independent of subsequent operation of said switch means back to its first state.

4,242,673

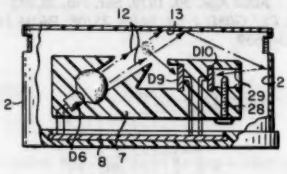
OPTICAL PARTICLE DETECTOR

Glenn F. Cooper, Hingham, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Mar. 13, 1978, Ser. No. 885,369

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—630 **5 Claims**



1. An optical particle detector comprising:

means including wall means forming a chamber;

means for directing light on a path through the chamber;

a first photovoltaic cell optically disposed to respond primarily to background light scattered from the wall means and from the path by particles in the path to produce a first signal proportional to particle scattered light and background light;

a second photovoltaic cell disposed outside the through path and optically disposed to view substantially entirely background light to which the first cell is exposed and which is scattered from the wall means around and outside the through light path to produce a second electrical signal across the second cell proportional to background light; and

circuit means connecting the two cells with the anode of each cell coupled to the cathode of the other cell so as to produce an output signal substantially only proportional

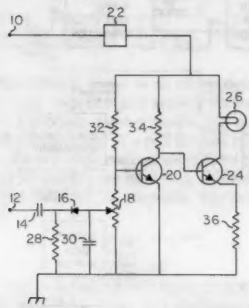
to particle scattered light and substantially independent of background light scattered from outside the through light path.

4,242,674

ALTERNATOR FAILURE WARNING INDICATOR

Edward W. Wheeler, R.F.D. #2, Elizabethton, Tenn. 37643

Filed Jan. 8, 1979, Ser. No. 1,919
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—635 **1 Claim**



1. In an aircraft equipped with an electrical system comprising an alternator with solid state diode rectifiers producing direct current as the principal component of the total current output when operating normally, the improvement comprising a warning indicator selected from the group consisting of those giving visible and audible signals, said indicator giving a tangible warning to an aircrew member of said aircraft when the alternating current component of said total current reaches a predetermined level symptomatic of incipient failure of some component of said alternator or said solid state rectifiers, said indicator comprising means conducting current from said electrical system to switching means responsive to a preselected level of the alternating current from said electrical system comprising, in the positive side of said switching means, an integrated circuit which will accept an input ranging from 12 to 24 nominal volts and have an output of 12 nominal volts, in the negative side a blocking capacitator, a diode rectifier and a variable resistance controlling the voltage to the base of an NPN transistor, the collector of said transistor directly connected to the base of a second NPN transistor such that when said first transistor is conducting said second transistor is non conducting and vice versa such that when said first transistor is non-conducting said second transistor is conducting current in series with said warning indicator and activating said indicator, the level of said alternating current which will activate said indicator being controlled by a pre-selected level of said variable resistance.

4,242,675

DISPLAY AND KEYBOARD SCANNING FOR ELECTRONIC CALCULATION OR THE LIKE

Gary W. Boone, and Michael J. Cochran, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

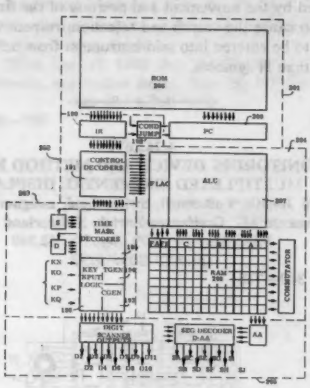
Continuation of Ser. No. 420,999, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 163,565, Jul. 19, 1971, abandoned. This application Dec. 2, 1977, Ser. No. 856,932
Int. Cl.² G06F *3/14*
U.S. Cl. 340—711 **27 Claims**

1. A calculator system comprising:

(a) a plurality of key switches for entering information into said calculator system, the switches being connected in an array of rows and columns;

(b) a plurality of display elements arranged in sequence to represent multiple digits or characters, the display element having first input terminals coupled to receive coded display outputs of the calculator system;

(c) means for generating keyboard/display timing signals for simultaneously energizing individual columns in the switch array and second input terminals of the display elements; and



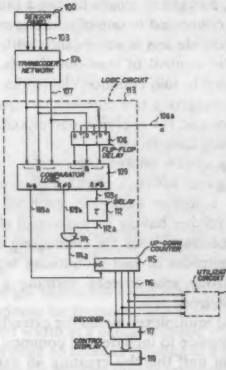
(d) programmed scanner means provided in the calculator system responsive to inputs from rows of key switches in correlation with the keyboard/display timing signals for entering information into the calculator system.

4,242,676

INTERACTIVE DEVICE FOR DATA INPUT INTO AN INSTRUMENT OF SMALL DIMENSIONS

Christian Piguet, and Jean-Felix Perotto, both of Neuchatel, Switzerland, assignors to Centre Electronique Horloger SA, Neuchatel, Switzerland

Filed Dec. 13, 1978, Ser. No. 968,917
Claims priority, application Switzerland, Dec. 29, 1977, 16178/77; Jul. 17, 1978, 7690/78
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—711 **22 Claims**



1. An interactive device for the input of data into an instrument of small dimensions, comprising: at least one manually actuated sensor having a plurality of N electrodes placed side by side, said N electrodes defining a number greater than N of possible positions of a finger on the sensor; a control display unit for displaying the data to be entered into said instrument to permit inspection of said data; a transcoder coupling said sen-

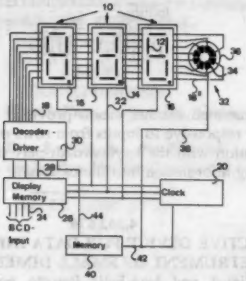
sor to said control display unit for delivering output signals to said control display unit, each discrete output signal of said transcoder corresponding to one of said possible positions of the finger on said sensor; and electronic means coupled to said control display unit for processing said data; said control display unit being responsive to output signals of said transcoder produced by the movement and position of the finger on said sensor to cause the search and selection, respectively, of one symbol to be entered into said instrument from an alphabet of greater than N symbols.

4,242,677

MONITORING DEVICE AND METHOD FOR A MULTIPLEXED SEGMENTAL DISPLAY

Eberhard Jonath, Volketswil, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed May 24, 1979, Ser. No. 42,249
Int. Cl.³ G09F 9/32
U.S. Cl. 340—715 **8 Claims**



1. In a display having a plurality of display units each having a multiplicity of display segments having a common electrode, each of said display segments further having an individual electrode, said display means further having first connecting means for connecting corresponding ones of said individual electrodes in said display units to each other thereby forming electrode sets, energizing means having a plurality of energizing lines each connected to one of said electrode sets for energizing said electrode sets in accordance with the symbol to be displayed under control of read-out signals, and multiplexer means connected to said common electrodes and said energizing means for energizing said common electrodes in a predetermined sequence and for applying corresponding read-out signals to said energizing means:

a monitoring system comprising

a monitoring unit having a plurality of monitoring segments having a common electrode, each of said monitoring segments further having an individual electrode;

second connecting means for connecting each of said individual electrodes of said monitoring segments to one of said electrode sets, thereby forming a plurality of extended electrode sets;

means in said multiplexer means for extending said predetermined sequence to include said common electrode of said monitoring unit thereby creating an extended sequence; and

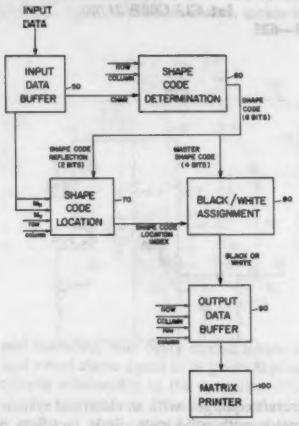
additional means connected to said energizing means for applying a test signal energizing all of said extended electrode sets to said extended electrode sets during energization of said common electrode of said monitoring unit, thereby energizing all of said monitoring segments only if all of said individual electrodes forming said electrode sets are in operative condition.

4,242,678

VARIABLE SIZE CHARACTER GENERATION USING NEIGHBORHOOD-DERIVED SHAPES

Daniel W. Somerville, Hingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jul. 17, 1978, Ser. No. 925,024
Int. Cl.³ G06F 3/14
U.S. Cl. 340—728 **20 Claims**



1. A method for producing expanded versions of matrix defined characters of constant point density comprising the steps of:

a. defining each character through a basic character matrix wherein each element consists of either "black" or "white";

b. assigning a shape and corresponding code to each element of the basic character matrix on the basis of a predetermined identification of said shape with the pattern of blacks and whites in a neighborhood of the basic character matrix centering on said element;

c. producing a quantized representation of said shape in response to said code, having a matrix pattern of black and white elements;

d. coordinating said quantized representation with an expansion matrix subdivided in accordance with desired horizontal and vertical expansion factors;

e. forming an expanded point array with elements matching the subdivisions of said expansion matrix such that each element of the expanded point array is assigned a black if and only if the center of the corresponding expansion matrix subdivision coincides with a black element of said quantized representation; and

f. combining the expanded point arrays in a matrix defined by the ordering of elements of said basic character matrix.

4,242,679

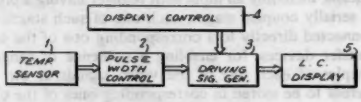
LIQUID CRYSTAL DISPLAY MECHANISM

Shinji Morozumi; Yoshio Yamazaki; Tatsushi Asakawa, and Yasunori Nakazaki, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 13, 1978, Ser. No. 941,881
Claims priority, application Japan, Sep. 13, 1977, 52/110763
Int. Cl.³ G02F 1/13
U.S. Cl. 340—765 **14 Claims**

1. A liquid crystal display driving circuit comprising in combination a plurality of liquid crystal display cells having electrodes defining a plurality of display digits, said driving circuit including drive means for applying first drive signals and second drive signals to liquid crystal display cells for selectively effecting an effective voltage across said sensing

means for detecting a change in condition, and in response thereto, for producing a sensing signal representative of the change in said condition, pulse width control means coupled to said sensing means for receiving said sensing signal and in response thereto applying a control signal having a pulse width representative of the change in condition sensed by said sensing means to said driving means, said driving means in response to said control signal being adapted to vary the pulse width of



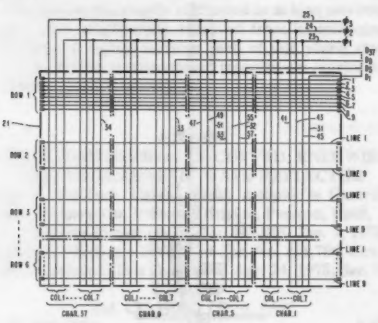
at least said first driving signal to an extent determined by the pulse width of said control signal applied thereto, each of said driving means, electronic sensing means and pulse width control means being comprised of a plurality of integrated circuit elements, the characteristics of said integrated circuit elements of said electronic sensing means being utilized to detect the change in condition and in response thereto produce said sensing signal.

4,242,680

MULTIPLE DATA LINE SHIFT GAS PANEL ASSEMBLY

John R. Beidl, Red Hook; Tony N. Criscimagna, and James C. Greeson, Jr., both of Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,450
Int. Cl.³ G09F 9/313
U.S. Cl. 340—771 **15 Claims**



1. A system for selective manipulation of information for display in a gaseous discharge display device comprising in combination

a gaseous discharge device adapted for operation in a shifting mode,

a multi-phase drive source for driving said panel,

first and second sealed glass plates filled with an ionizable gas,

each of said glass plates having an array of conductors formed thereon,

the conductors on one of said arrays on said first plate being disposed substantially orthogonal to the conductors on the other of said arrays on said second plate, the respective intersections of said orthogonally disposed conductors defining gaseous discharge sites,

the number of conductors on said first plate comprising an integer which is a multiple of the number of phases in said multi-phase drive source,

multiple data entry means associated with said first plate, said multiple data entry means including means for simultaneously entering data into different pre-determined positions on said display device, and

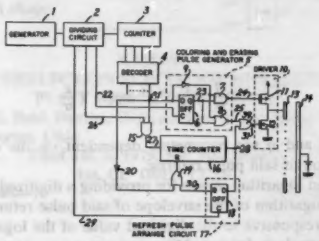
means for decreasing the update time of said panel by simultaneously operating said multiple data input means.

4,242,681

DRIVING SYSTEM FOR DISPLAY

Junichi Tabata, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Aug. 11, 1978, Ser. No. 933,087
Claims priority, application Japan, Aug. 16, 1977, 52-98123
Int. Cl.³ G09F 9/32
U.S. Cl. 340—785 **2 Claims**



1. In a driving system for an electrochromic display including a display information signal generator, a coloring and erasing pulse generator and electrochromic display means for displaying information in response to the coloring and erasing pulses, the improvement comprising: a memory time counter circuit for generating a count during a time interval controlled by the display information signal and for generating an output signal after a predetermined period of time, and having a reset terminal; a driver circuit connected to receive the output pulses from said coloring and erasing pulse generator and the output signal from said memory time counter circuit, and connected to apply an output signal to drive said electrochromic display means; refresh pulse generating means connected between the output of said memory time counter circuit and the reset terminal of said memory time counter circuit for resetting said memory time counter each time said memory time counter develops an output signal; and means for applying the display information signal to reset said memory time counter when said display information signal changes.

4,242,682

MOVING TARGET INDICATION RADAR

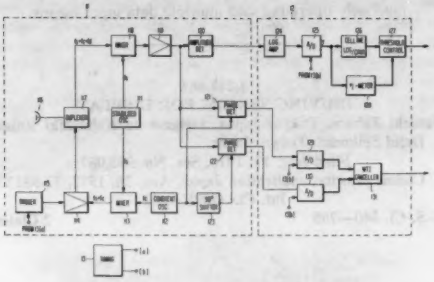
Toshimitsu Musha, Machida; Matsuo Sekine, Tokyo; Takeru Irabu, Tokyo, and Eichi Kiuchi, Tokyo, all of Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,614
Claims priority, application Japan, Aug. 31, 1978, 53-107048
Int. Cl.³ G01S 7/30, 13/52
U.S. Cl. 343—7 A **10 Claims**

1. A moving target indication radar comprising:

a transmitting means for transmitting a microwave pulse of a predetermined width at a predetermined repetition period into space through an antenna rotating at a constant speed;

a receiving means for receiving pulse returns from stationary and moving objects lying in the space scanned by said antenna, said pulse returns being received for every unit azimuth region corresponding to one microwave pulse in the form of a chain of radar data respectively for unit range regions related to the width of said microwave pulse, said pulse returns including a Weibull clutter having the probability density function $P_W(x)$ for its envelope given by



$$P_\eta(x) = \frac{\eta}{\sigma}\left(\frac{x}{\sigma}\right)^{\eta-1}\exp\left[-\left(\frac{x}{\sigma}\right)^{\eta}\right]$$

where σ and η are parameters dependent on the envelope distribution of said pulse returns;

digitized logarithm means for providing a digitized value of the logarithm of the envelope of said pulse returns;

means responsive to the digitized value of the logarithm of the envelope for providing a signal representative of an average of the pulse returns from a predetermined number of adjacent ones of said unit range regions, and for subtracting said average signal from an incoming digitized pulse return corresponding substantially to the middle one of said unit range regions;

means responsive to the output of the averaging-subtracting means for providing a signal representative of an anti-logarithm of the input thereto;

parameter means responsive to the digitized pulse returns for developing a signal representative of said parameter η; and

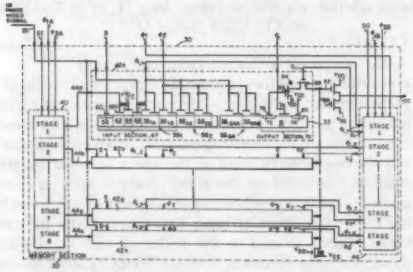
a threshold detection means, having a threshold which is variable in response to said η representing signal, and passing those components of said anti-logarithm output having amplitudes higher than said threshold value; whereby the output of said variable threshold means constitutes a radar video signal virtually free from said Weibull clutter.

4,242,683

SIGNAL PROCESSOR

Arthur M. Cappon, Boston; John D. Collins, Burlington, and Jay P. Sage, Newton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 26, 1977, Ser. No. 800,838
Int. Cl.[3] G01S *13/52*; H03K *23/08*
U.S. Cl. 343—7.7 **8 Claims**



1. In a radar system wherein a series of video signals are produced in response to a series of transmitted pulses, a signal processor comprising:

(a) a plurality of charge transfer devices, each one having a signal input terminal;

(b) means, including an input bus connected directly to the signal input terminal of each one of the plurality of charge transfer devices, for coupling each one of the series of video signals simultaneously to the signal input terminal of each one of the plurality of charge transfer devices;

(c) means, including an input shift register having a plurality of serially coupled stages, each one of such stages being connected directly to a corresponding one of the charge transfer devices, for enabling a sequence of range cell samples of each one of the video signals in the series thereof to be stored in corresponding ones of the charge transfer devices, each one of the charge transfer devices storing a set of samples corresponding to radar returns from objects at a corresponding range; and

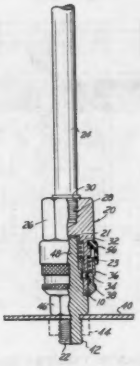
(d) means, including an output shift register having a plurality of serially coupled stages, each one of such stages being coupled to a corresponding one of the charge transfer devices, for enabling the sets of samples stored in the charge transfer devices to be sequentially read from such devices.

4,242,684

QUICK DISCONNECT ANTENNA MOUNT

William D. Wolverton, 10320 Henderson Rd., Otisville, Mich. 48463

Filed Jul. 13, 1979, Ser. No. 57,273
Int. Cl.[3] H01Q *1/32*
U.S. Cl. 343—715 **15 Claims**



1. A quick disconnect mounting device for a vehicle-mounted antenna, comprising:

a male member and a female member, engagable one with the other, said male member operable to be fixed on a portion of the vehicle, said male member including a lower threaded end portion and an upper end portion operable to be seated in a central opening in one end of the female member, said female member having a threaded opening in its other end for receiving a like threaded end of the antenna, said central opening including a ball detent latch means and a slip ring mounted on and cooperable with said latch means; a first spring biasing means mounted intermediate said male and female member, a second spring biasing means mounted between said slip ring upper end and said female member, said latch means operable to lock the upper end portion of said male member on applied downward pressure and the slip ring operable against the force of said second biasing means for unlocking said upper end portion responsive to the upward pull of the snap ring, said first biasing means opera-

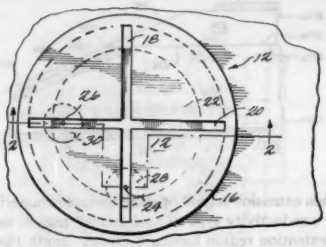
ble to separate said members with a strong force of separation.

4,242,685

SLOTTED CAVITY ANTENNA

Gary G. Sanford, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Apr. 27, 1979, Ser. No. 34,135
Int. Cl.³ H01Q *13/18*
U.S. Cl. 343—770 **37 Claims**



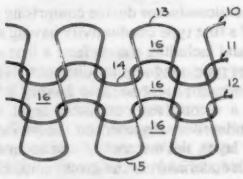
1. A crossed slot antenna comprising:
a resonant cavity having plural intersecting radiating slots formed in one wall thereof,
an electrically conductive plate disposed within said cavity and substantially spaced from all internal cavity walls thereby lengthening the effective electrical resonant dimensions of the cavity for a given physical size of cavity, and
r.f. feed means electrically connected to at least one point on said plate, substantially removed from its midpoint, for feeding r.f. signals to/from each of said plural slots via said plate with predetermined respectively corresponding relative phase relationships.

4,242,686

THREE-DIMENSIONALLY CURVED, KNIT WIRE ELECTROMAGNETIC WAVE REFLECTOR

William L. MacTurk, Upland, Calif., assignor to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Continuation-in-part of Ser. No. 647,015, Jan. 7, 1976, abandoned, which is a division of Ser. No. 591,794, Jun. 30, 1975, abandoned. This application Apr. 24, 1978, Ser. No. 899,690
Int. Cl.² H01Q *15/16, 1/40*
U.S. Cl. 343—912 **8 Claims**



1. An electromagnetic wave reflecting structure comprising:
(a) an electromagnetic wave member comprising first and second superimposed electrical conductors, each consisting of a plurality of non-closed loops interconnected in a knit stretchable in any direction as a finished knit, said first conductor being formed into a smoothly continuous and three-dimensional curved layer of predetermined shape, said second conductor being superimposed upon said first conductor, one of said conductors being stretched substantially 50% relative to the other so that the loops of said second conductor substantially overlie the open spaces between the loops of said first conductor, thereby to provide a conducting and reflecting member having an effective aperture size averaging substantially less than the aperture size of each conductor;
(b) a coating disposed about each of said conductors and consisting of a thermo-setting resin to make said conductors substantially impervious to corrosive substances in the ambient environment, said reflecting member being displaced from but no more that 3 mils away from the outer surface of the combined structure; and
(c) support means on the back surface of said wave reflecting member to maintain said member rigidly in its predetermined shape.

4,242,687

HEATED DEFLECTION ELECTRODE ASSEMBLY FOR A JET DROP RECORDER

Surinder K. Bahl, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 6, 1979, Ser. No. 55,412
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—75 **9 Claims**

1. A deflection electrode assembly for use in a jet drop recording head having means for generating a plurality of drop streams in two parallel rows, each stream consisting of a series of liquid recording drops, means for selectively charging said drops, a pair of opposed catchers for catching the drops, and a source of drop deflecting potential comprising:
a substantially electrically conductive deflection electrode means,
support means for supporting said deflection electrode means in a position parallel to said rows of drops and extending therebetween along a line midway between said catchers,
means for connecting said electrode means to said source of drop deflecting potential, and
means for heating said deflection electrode means to a temperature greater than the ambient temperature in said jet drop recording head, said heating means comprising,
a pair of substantially electrically conductive wires which generate heat when electric current is passed thereto, running parallel to and spaced apart from the upper and lower edges of said deflection electrode, said wires electrically insulated from said deflection electrode, and two sheets of thermally conductive but electrically nonconductive material which sandwich said wires and said deflection electrode.

4,242,688

INK JET PRINTER

Michael Döring, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1979, Ser. No. 87,619
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846844
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **7 Claims**

1. An ink jet printer, comprising at least one nozzle which is

connected, via a pressure chamber, to an ink supply duct, said pressure chamber comprising a wall which can be moved, by means of an electrodemechanical converter, in order to realize droplet-like ejection of ink from the nozzle, characterized in that the converter (9) is adapted to vibrate continuously during

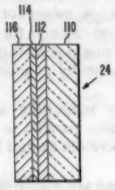
operation, a brake electrode (10) being arranged just in front of the nozzle aperture (7), it being possible to apply a voltage to said brake electrode as desired, the arrangement being such that when the voltage is switched off, a droplet is ejected, whilst when the voltage is switched on, the emerging droplet is intercepted, braked and withdrawn into the nozzle (2).

4,242,689

ABLATIVE OPTICAL RECORDING MEDIUM

Allen Bloom, East Windsor, and Robert A. Bartolini, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,271
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 **7 Claims**



1. In an ablative optical recording medium which comprises a light reflecting material coated with a light absorbing material, the improvement which comprises employing as the light absorbing layer a layer of di-indeno[1,2,3-cd:1',2',3'-lm]perylene.

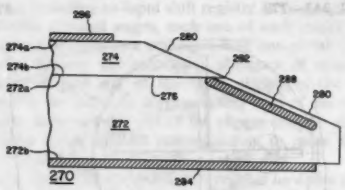
4,242,690

HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 6, 1978, Ser. No. 913,026
Int. Cl.³ H01L *29/90*
U.S. Cl. 357—13 **17 Claims**

1. In a semiconductor device containing at least one p-n junction including a first region of semiconductor material of a selected conductivity type having top and bottom surfaces, a second region of semiconductor material of conductivity type opposite that of said first region and having upper and lower surfaces, the lower surface of said second region being coextensive and contiguous with the top surface of said first region, a p-n junction located between said first and second regions, said first and second regions including a common edge side surface, a portion of said common edge side surface being beveled so as to pass through the entire thickness of said second region and a portion of the thickness of said first region, said beveled surface being oriented at a small acute angle with respect to the plane of said p-n junction, and a junction termination located at the intersection of said p-n junction with said beveled surface, the improvement comprising:



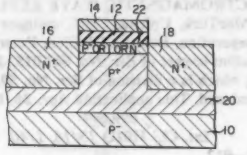
a junction extension region of semiconductor material of the same conductivity type of said second region, said junction extension region having a greater length than thickness, said junction extension region having a length less than the length of said beveled surface and being located in the proximity of said beveled surface and oriented approximately parallel thereto, a substantial portion of said junction extension region being located within said first region and oriented generally parallel to the plane of said junction termination.

4,242,691

MOS SEMICONDUCTOR DEVICE

Norihiko Kotani, and Satoru Kawazu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,812
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23 **9 Claims**



1. An MOS semiconductor device comprising a semiconductor substrate of a first type conductivity having a low impurity concentration and including a main face, a first semiconductor layer of the first type conductivity disposed on said main face of said semiconductor substrate and having a high impurity concentration, a second semiconductor layer of a predetermined type conductivity disposed on the surface of said first semiconductor layer, the material of said second semiconductor layer being a material from the group consisting of a lightly doped semiconductive material and an intrinsic semiconductive material, at least a portion of said second semiconductor layer constituting a channel region of said semiconductor device, a pair of source and drain regions disposed on opposite lateral sides of said channel region and sandwiching said channel region therebetween, each of said source and drain regions having a second type conductivity and a high impurity concentration, an oxide film on said channel region, and a gate electrode disposed on said oxide film, whereby even where the channel region is thin and the distance between the source and drain regions is short, punch-through c. n be prevented.

4,242,692

CHARGE TRANSFER DEVICE WHICH HAS A PAIR OF STRAIGHT PORTIONS JOINED BY A DIRECTION CHANGING PORTION

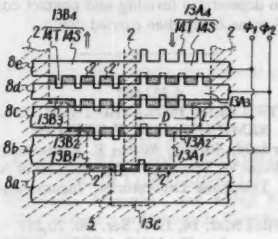
Yoshiaki Hagiwara, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 31, 1979, Ser. No. 44,224

Claims priority, application Japan, Jun. 2, 1978, 53/66561; Apr. 6, 1979, 54/13283

Int. Cl.³ H01L *29/78*; G11C *19/28*

U.S. Cl. 357—24 **15 Claims**



1. An electrical charge transfer device comprising, a semiconductor substrate having a plurality of aligned charge transfer regions and storage regions, a direction changing portion located between two of said charge transfer regions to change the charge transfer direction and wherein the charge transfer direction in at least one of said two charge transfer regions is toward said direction changing portion, a plurality of electrodes associated with said storage, transfer and direction changing regions, means for applying potentials to said electrodes, a channel stopper region having a different conductivity than said charge transfer and storage regions, defining the borders of said transfer and storage regions provided commonly to said plurality of charge transfer and storage regions and having a shape such that asymmetrical potential wells are formed in the respective charge transfer regions in the charge transfer direction, said asymmetrical potential wells and said applied potentials being effective to cause charge transfers to said storage regions each of said storage regions having length dimensions in the charge transfer direction and width dimensions in the direction transverse to the charge transfer direction and wherein the lengths of said storage regions become progressively longer and the widths become progressively shorter as said storage regions become closer spaced to said direction changing portion.

4,242,693

COMPENSATION OF V_{BE} NON-LINEARITIES OVER TEMPERATURE BY USING HIGH BASE SHEET RESISTIVITY DEVICES

Joseph Biran, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

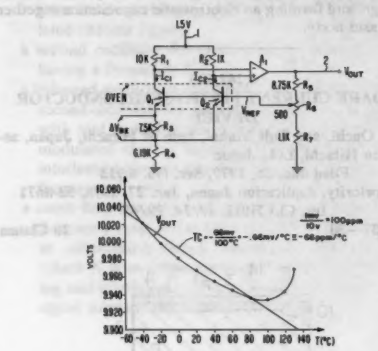
Filed Dec. 26, 1978, Ser. No. 972,742

Int. Cl.³ H01L *23/56*

U.S. Cl. 357—28 **14 Claims**

1. A transistor comprising:

a collector, an emitter, and a high resistivity base, the transistor having a base-emitter voltage V_{BE} given by the equation $V_{BE} \approx V_{GO} + (kT/q) \ln (I_c/D)$, where V_{GO} is the gap voltage of silicon at 0° K., k is Boltzman's constant, T is temperature of the base-eitter junction, q is the charge on an electron, I_c is collector current and D is a temperature-independent constant, and wherein the doping concentration of said base is determined such that the second partial derivative of V_{BE} with respect to temperature with I_c held constant is approximately zero, thereby providing a linear



relation between the base-emitter voltage and temperature.

4,242,694

SOLID-STATE COLOR IMAGING DEVICE

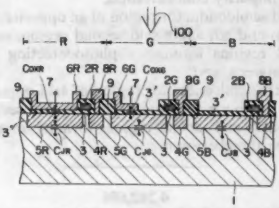
Norio Koike, Tokyo, and Masaharu Kubo, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 12, 1977, Ser. No. 832,676

Claims priority, application Japan, Sep. 13, 1976, 51-108785

Int. Cl.³ H01L *27/14, 31/00, 29/78*; H04N *9/07*

U.S. Cl. 357—30 **22 Claims**



1. A solid-state color imaging device comprising a semiconductor body of a first conductivity type having a major surface portion and three sets of photoelectric elements corresponding to a first, a second, and a third primary color of light, wherein said first color of light is long wavelength light, said second color of light is middle wavelength light, and said third color of light is short wavelength light, respectively, disposed in said major surface portion such that each of said sets corresponding to a respective color component is separated by an optical filter, a respective photoelectric element being comprised of:

(a) a field-effect transistor having a source region and a drain region of a second conducitvity type opposite to said first conductivity type, a gate insulating film provided so as to cover a region lying between said source region and said drain region, and a gate electrode provided on said gate insulating film, one of said source region and said drain region constituting with said substrate a photodiode;

(b) a transparent insulating film which is provided so as to cover said photodiode; and

(c) a transparent electrode provided on the transparent insulating films of two sets of said photoelectric elements of said three sets wherein the transparent electrode of the photoelectric element for said first light covers over its respective photodiode, the transparent electrode of the photoelectric element for said second light covers a part of its respective photodiode, and the photoelectric ele-

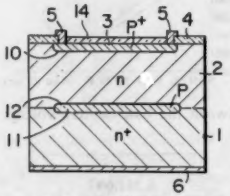
ment for said third light is not covered by transparent electrode, permitting at least part of the incident light to permeate therethrough, being held at a predetermined voltage, and forming an electrostatic capacitance together with said body.

4,242,695

LOW DARK CURRENT PHOTO-SEMICONDUCTOR DEVICE

Hirobumi Ouchi, and Toji Mukai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1979, Ser. No. 6,913
Claims priority, application Japan, Jan. 27, 1978, 53-8671
Int. Cl.³ H01L *27/14, 29/48*
U.S. Cl. 357—30 **20 Claims**



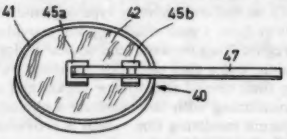
1. A photodiode consisting essentially of:
(a) a first semiconductor region of one conductivity type having a first predetermined impurity concentration;
(b) a second semiconductor region of said one conductivity type on said first region having a second predetermined impurity concentration lower than said first predetermined impurity concentration;
(c) a third semiconductor region of an opposite conductivity type on and adjoining said second region, said third and second regions forming a photodetecting pn junction therebetween; and
(d) a fourth semiconductor region of said opposite conductivity type buried between said first and second regions, said fourth and second regions forming an additional pn junction therebetween.

4,242,696

METHOD OF FORMING A CONTACT ON THE SURFACE OF A SEMICONDUCTOR BODY BY SERIGRAPHY AND BODY OBTAINED BY MEANS OF THIS METHOD

Daniel Diguet; Gerard A. David, and Pierre Aubril, all of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 967,940
Claims priority, application France, Dec. 13, 1977, 77 37517
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **10 Claims**



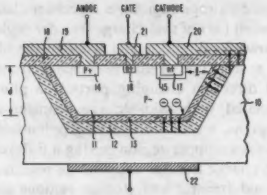
1. A method of forming a contact configuration for soldering a metal connection on a region of a surface of a semiconductor body having a zone of a given conductivity type which adjoins said surface at said region, said method comprising the provision by serigraphy on at least a part of said region of a conductive paste which, in a vitrifiable phase, comprises at least a metal which is finely divided and a doping element which gives the same conductivity type, said plate then being vitrified thermally such that said dopant migrates in at least a surface part of said region, characterized in that after providing the conductive paste with the doping element in a first deposition and after at least partly drying said first deposition, a second deposition with a conductive past containing, in a vitrifiable phase, at least a principal metal and being substantially free from said doping element is carried out at least at a restricted part of said region comprising the location where said connection is to be soldered, at least a part of the second deposition bearing on a part of the first deposition, the assembly of the two depositions forming said contact configuration and the vitrification being then carried out.

4,242,697

DIELECTRICALLY ISOLATED HIGH VOLTAGE SEMICONDUCTOR DEVICES

Joseph E. Berthold, Stirling; Adrian R. Hartman, New Providence, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1979, Ser. No. 20,217
Int. Cl.³ H01L *27/04*
U.S. Cl. 357—49 **17 Claims**



1. An integrated circuit including a high voltage semiconductor device comprising a polycrystalline semiconductor substrate (10), a region of single crystalline semiconductor (11) the bulk of which has a first conductivity type formed at a major surface of said substrate, and a localized region (e.g., 15,) formed at the surface of said single crystalline region, characterized in that said device further comprises a semi-insulating layer (13) between said substrate and single crystalline region, said semi-insulating layer having trapping states capable of taking on charge from said single crystalline region and thereby shield said localized surface region from the potential of the substrate when a bias is supplied thereto.

4,242,698

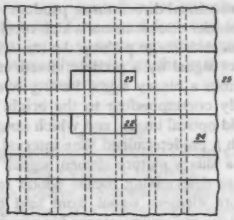
MAXIMUM DENSITY INTERCONNECTIONS FOR LARGE SCALE INTEGRATED CIRCUITS

Prabhakar B. Ghate, Dallas; Arthur M. Wilson, Richardson, and Clyde R. Fuller, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 2, 1977, Ser. No. 847,956
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—71 **8 Claims**

1. A semiconductor device, including a double level metal interconnect system having a surface insulator on the semiconductor; and an inter-level insulator between metal levels, wherein the device surface insulator embodies a via etch stop layer, the first level metal is an adherent metal of a high conductivity and not appreciably attacked by aluminum etchants; the inter-level insulator is silicon dioxide; the apertures in the inter-level insulator have longitudinal and transverse dimensions which exceed the width of the first and second level

metal leads by at least 10% of the space between adjacent leads, the second level interconnect is aluminum, and the spacing between leads is substantially the same at all locations on the device.



4,242,699

RECORDING AND REPRODUCING APPARATUS FOR COLOR VIDEO SIGNALS

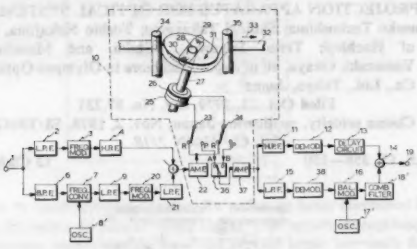
Masaaki Kobayashi, Kawanishi, and Kiyoji Fujisawa, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 14, 1977, Ser. No. 842,334

Claims priority, application Japan, Oct. 19, 1976, 51-125758; Apr. 22, 1977, 52-47156

Int. Cl.³ H04N 5/76

U.S. Cl. 358—4 **3 Claims**



1. A recording and reproducing apparatus for color video signals comprising:

a band pass filter, having an input for receiving a NTSC color video signal, having a frequency pass band for separating the chroma signal from a received NTSC color video signal;

a first oscillator for producing a first carrier signal having a frequency f_a which is within the bandwidth of said chroma signal and which may be expressed by the equation

$$f_a = f_s - n/4 f_H,$$

where n is a predetermined odd integer, f_s is the center frequency of said chroma signal, and f_H is the line frequency of said received NTSC color video signal;

a frequency converter coupled to said band pass filter and said first oscillator for producing a frequency converted chroma signal having a carrier frequency equal to the algebraic sum of f_s and f_a which is nearest zero, whereby the upper and lower sidebands of said chroma signal are interleaved in said frequency converted chroma signal by folding of said chroma signal at zero frequency;

a frequency modulator coupled to said frequency converter for frequency modulating said frequency converted chroma signal;

a recording-reproducing means coupled to said frequency modulator for recording and reproducing said frequency modulated chroma signal;

a demodulator coupled to said recording-reproducing apparatus for demodulating said reproduced frequency modulated chroma signal;

a second oscillator for producing a second carrier signal having a frequency f_a;

a balanced-modulator coupled to said demodulator and said second oscillator for modulating said second carrier signal with said demodulated chroma signal, whereby said demodulated chroma signal is frequency converted to an interleaved chroma signal having a band centered about a frequency f_s; and

a comb filter coupled to said balanced-modulator, having a frequency response to pass frequencies near $f_s \pm K f_H$ and to substantially block frequencies near $f_s \pm (K + \frac{1}{2}) f_H$, where K is an arbituary integer including zero, for filtering said interleaved chroma signal and obtaining a chroma signal substantially equal to the original chroma signal.

4,242,700

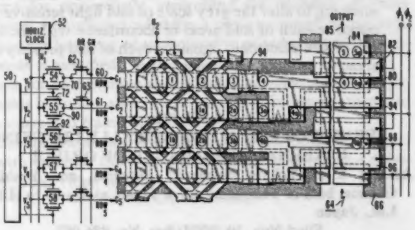
LINE TRANSFER CCD IMAGERS

Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 22, 1979, Ser. No. 5,073

Int. Cl.³ H04N 9/07, 3/15; H01L 29/78

U.S. Cl. 358—44 **32 Claims**



1. In combination:

a charge transfer imager of the line transfer type comprising an array of charge transfer locations arranged in a plurality n of rows numbered 1, 2, 3 . . . n;

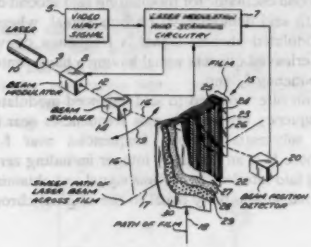
means for applying clock voltages to the array for reading out substantially one field of the array comprising means for concurrently applying clock voltages to a first pair j and j+1 of adjacent rows of the array for serially reading out the locations in these rows in interleaved fashion, and for repeating this process for each succeeding pair j and j+1 of adjacent rows, one pair at a time, until substantially one complete field has been read out of the array, where j is an odd integer having the consecutive odd values 1, 3, 5 and so on, respectively, for succeeding pairs of adjacent rows in the array; and

means for applying clock voltages to the array for reading out a second field of the array comprising means for concurrently applying clock voltages to a pair j+1 and j+2 of adjacent rows of the array for serially reading out the locations in these rows in interleaved fashion, and for repeating this process for each succeeding pair j+1, j+2 of adjacent rows of the array until the second complete field of the array has been read out, where (j+1) has the successive even values 2, 4, 6 and so on, for succeeding pairs of adjacent rows in the array.

4,242,701
COLOR HARDCOPY FROM ELECTRONIC INFORMATION

Leon A. Levinson, Agoura, and John K. Cool, Thousand Oaks, both of Calif., assignors to Ixion, Inc., Westlake Village, Calif.

Filed Sep. 10, 1979, Ser. No. 73,933
Int. Cl.³ H04N *1/46, 9/491*
U.S. Cl. 358—75 **17 Claims**



1. An apparatus for producing a color image from electronic video input signals containing the additive primary colors red, green and blue comprising:

a laser for producing a monochromatic laser beam;

a photographic medium comprising a transparent film having on one side a repeating pattern of color areas composed of said additive primary colors red, green and blue and an unexposed light sensitive layer on the reverse side;

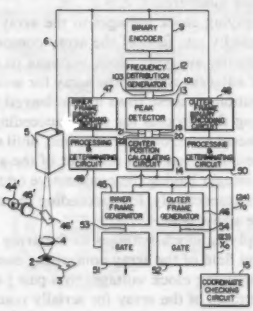
means for scanning said laser beam across successive lines of said light sensitive layer from said reverse side; and

means for modulating the intensity of said beam during scanning to alter the grey scale of said light sensitive layer opposite each of said areas in accordance with the intensity of said electronic signal for each of said primary color areas to produce said color image.

4,242,702
APPARATUS FOR AUTOMATICALLY CHECKING EXTERNAL APPEARANCE OF OBJECT

Asahiro Kuni, Tokyo; Nobuyuki Akiyama, and Yoshimasa Oshima, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 30, 1977, Ser. No. 856,097
Claims priority, application Japan, Dec. 1, 1976, 51/143329; Dec. 27, 1976, 51/156504
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—106 **23 Claims**



1. An apparatus for automatically checking the position of an object having a surface area of a predetermined size and a contour of the surface area, comprising:

(a) an optical system which illuminates said object to produce an optical image having different bright and dark portions between said surface area of said object and said contour thereof;

(b) an image pick-up device which scans said optical image in two-dimensional directions to produce a picture signal;

(c) binary encoder circuit means which receives said picture signal from said image pick-up device, which thresholds said picture signal by a predetermined value to convert the same into a binary signal having two logical levels respectively corresponding to the bright and dark portions of said optical image, and which samples said binary signal with a predetermined time interval to convert the same into a binary picture element signal;

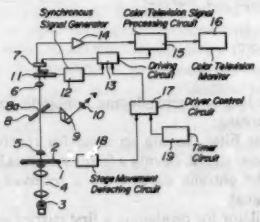
(d) coordinate determining means which receives said binary picture element signal from said binary encoder circuit means, comprising means for counting said binary picture element signal in said two-dimensional directions with respect to one of said two logical levels to determine frequency distributions of the binary picture element signal in said two-dimensional directions with respect to said one logical level, and means for searching characteristic portions in said frequency distributions to extract coordinates of said contour of said object from said characteristic portions; and

(e) first check means for checking whether or not said coordinates determined by said coordinate determining means are within an allowable tolerance range preselected for a two-dimensional coordinate area scanned and imaged by said image pick-up device.

4,242,703
PROJECTION APPARATUS FOR OPTICAL SYSTEMS

Kosaku Tsuboshima; Shuichi Takayama; Yoshio Nakajima, all of Hachioji; Teruo Iwasawa, Mitaka, and Masafumi Yamazaki, Okaya, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1979, Ser. No. 87,231
Claims priority, application Japan, Nov. 2, 1978, 53/134426
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—150 **13 Claims**



1. A projection apparatus for optical systems, which is adapted to project an image of a sample disposed on a movable stage onto a television monitor screen and display thereon, and which comprises

an image sensor composed of a charge transfer element including photosensitive elements aligned with a picture element and operative to receive the image of the sample to be projected;

a driving circuit for scanning said image sensor;

a television monitor for displaying a video signal obtained from said image sensor when it is scanned by said driving circuit;

a memory device for storing the television signal;

a stage movement detecting circuit for detecting the movement of said stage;

a timer circuit for generating a signal everytime a given time elapses; and

a driver control circuit which, when said stage is moving, becomes operative to operate said driving circuit on the

basis of the output from said stage movement detecting circuit so as to scan said image sensor everytime said stage moves for a given distance and which, when said stage is stationary, becomes operative to operate said driving circuit on the basis of the signal from said timer circuit so as to scan said image sensor everytime a given time elapses, thereby normally displaying the image of said sample on said television monitor.

4,242,704

NOISE REDUCTION SYSTEM FOR COLOR TELEVISION SIGNAL

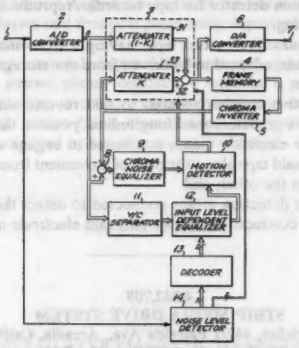
Yutaka Ito; Kazuo Yajima; Yoshiteru Iwanaga; Hiroshi Takahashi, and Masao Inaba, all of Tokyo, Japan, assignors to Tokyo Broadcasting System Inc. and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Mar. 8, 1979, Ser. No. 18,474

Claims priority, application Japan, Mar. 8, 1978, 53-26857; Mar. 8, 1978, 53-26858

Int. Cl.³ H04N *5/21, 9/535*

U.S. Cl. 358—167 **6 Claims**



1. A noise reduction system for reducing noise contained in an incoming television video signal, said system comprising, summing means having first and second input terminals for adding first and second signals respectively applied thereto to produce a sum signal;

means for coupling a first controllable fractional amplitude portion of the arriving video signal to the first input terminal of said summing means;

delay means, connected to receive said sum signal from said summing means, for delaying said sum signal for a period substantially equal to the period of one television frame; coupling means, including means for coupling a second controllable fractional amplitude portion of the delayed signal from said delay means to the second input terminal of said summing means; means for producing a differential signal representing the difference between the incoming video signal and the delayed video signal; comparator means for comparing said differential signal with a reference signal;

first control means for controlling said reference signal in response to said incoming video signal; and

second control means for controlling said first fractional amplitude portion and said second fractional amplitude portion in response to the output of said comparator means, the sum of said first and second fractional amplitude portions being a constant; whereby said summing means combines a fractional amplitude portion of each incoming television frame with a fractional amplitude portion of the sum of portions of preceding delayed frames to obtain an averaged noise-reduced video signal of an amplitude equivalent to that of the incoming video signal.

4,242,705

NOISE REDUCTION SYSTEM FOR VIDEO SIGNALS

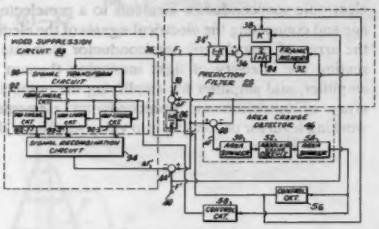
Norio Ebihara, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1979, Ser. No. 77,174

Claims priority, application Japan, Sep. 21, 1978, 53/116349; Nov. 15, 1978, 53/140673

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—167 **28 Claims**



1. A noise reduction system for reducing noise in a video signal which consists of a plurality of successive frames occurring at frame intervals, comprising:

means for storing at least one frame of said video signal for an integral multiple of said frame intervals;

means for mixing corresponding elements of a new frame of said video signal with said video signal stored in said means for storing to produce a frame difference signal;

means for transforming said frame difference signal into a plurality of video signal components;

means for respectively controlling the plurality of video signal components whereby a predetermined characteristic of at least one of said plurality of video signal components is modified;

means for recombining said plurality of video signal components including said at least one modified component into a corrected frame difference signal; and

means for combining said corrected frame difference signal with said new frame of said video signal to obtain a noise-reduced video signal.

4,242,706

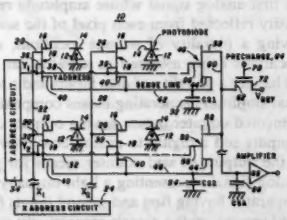
VISIBLE LIGHT AND NEAR INFRARED IMAGING DEVICE

Kent McCormack, Richardson; James E. Robinson, Dallas; William M. Knight, Jr., Plano, and Dana Dudley, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 13, 1978, Ser. No. 960,496

Int. Cl.² H04N *3/14*

U.S. Cl. 358—213 **11 Claims**



1. An imaging device comprising:

an addressing means; an array of optoelectronic semiconductor elements selectively connected to the addressing means; a multiplexer connected to the array of optoelec-

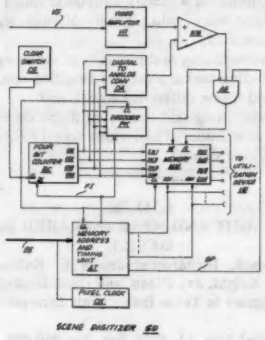
tronic semiconductor elements; a precharge means including a time controlled switch connected to the multiplexer; and an amplifier connected to the multiplexer, said array of optoelectronic semiconductor elements having its elements arranged for exposure to light emanating from a scene in the field of view for converting the light into electrical signals representative of the impinging light, and said precharge means, addressing means and multiplexer for alternately charging the elements of the array of optoelectronic semiconductor elements to a preselected voltage and connecting the electrical signals of the elements of the array of optoelectric semiconductor elements representing the intensity of light impinging thereon to the amplifier, said amplifier for amplifying the outputs of the array of optoelectronic semiconductor elements to a working level for processing into video signals for display.

4,242,707

DIGITAL SCENE STORAGE

Karoly Budai, Dix Hills, N.Y., assignor to Chyron Corporation, Plainview, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,021
Int. Cl.³ H04N *1/38*
U.S. Cl. 358—280 **2 Claims**



SCENE DIGITIZER 50

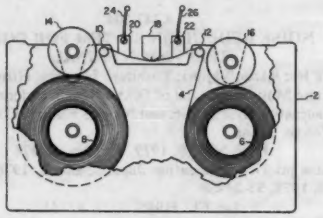
1. Apparatus for storing the representation of a scene comprising: scanning means for repetitively raster scanning and emitting a first analog signal whose amplitude represents the light intensity reflected from each pixel of the scene; memory means having a plurality of storage locations, each of said storage locations being assigned to a particular pixel of the scene, and having a plurality of data inputs and a write control input; signal amplitude generating means comprising a scan by scan incremented counter means having outputs connected to said data inputs and a digital to analog converter means connected to the outputs of said counter means for generating a second analog signal representing a light intensity; and analog signal comparator having first and second inputs for receiving the first and second analog signals respectively and an output means connected to said write control input means for emitting a signal thereto for recording in the associated storage location a representation of the amplitude of the second analog signal only when the amplitude of the first analog signal has a particular relationship with the amplitude of the second analog signal.

4,242,708

TAPE RECORDING APPARATUS USING CAPACITIVE DETECTORS AS TAPE POSITION SENSORS

James A. Drelling, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 30, 1979, Ser. No. 7,801
Int. Cl.³ G11B *15/06, 23/30*
U.S. Cl. 360—74.5 **10 Claims**



1. A position detector for tape recorder/reproducer apparatus comprising:

a non-conductive record tape, having a front side and reverse side, adapted to be driven from one storage spool to another;

a conductive member secured to said reverse side of said tape at a predetermined longitudinal position thereof;

capacitive electrode means positioned to engage said front side of said tape along the path of movement from said one spool to the other; and

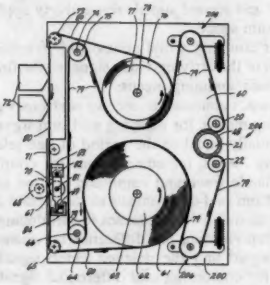
capacitive detection means connected to detect the passage of said conductive member past said electrode means.

4,242,709

STRIP MEDIA DRIVE SYSTEM

Klaus F. Stricker, 447-1 Fairview Ave., Arcadia, Calif. 91006

Filed Jan. 29, 1979, Ser. No. 7,361
Int. Cl.³ G11B *15/32, 15/43, 23/04*
U.S. Cl. 360—96.4 **55 Claims**



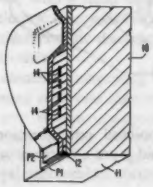
1. A strip media drive system comprising a pair of rotatable strip media packs for reeling the strip media therebetween, an endless belt coupling the rotation of the media packs together and a belt tensioner, the belt tensioner comprising at least first and second rotatable rollers, the first roller comprising a hard outer periphery and the second roller comprising a viscoelastic outer periphery, the first and second rollers being forced together on opposite sides of the endless belt to thereby deform the viscoelastic outer periphery so that as the belt is drawn between the rollers, rolling friction caused by the deformation creates a higher tension in the portion of the belt leaving the tensioner than in the portion entering the tensioner.

4,242,710

THIN FILM HEAD HAVING NEGATIVE MAGNETOSTRICTION

Robert D. Hempstead, Morgan Hill, and James B. Money, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,274
Int. Cl.[3] G11B 5/12, 5/30
U.S. Cl. 360—113 5 Claims



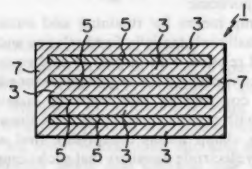
1. A thin film magnetic head assembly consisting:
first and second magnetic pole pieces formed as unitary thin film layers said first pole piece being deposited directly on a substrate
insulating material disposed between and separating said pole pieces; planar conductive coils in a substantially planar array disposed within said insulating material;
said pole pieces being formed from a magnetic material characterized by negative magnetostriction.

4,242,711

MULTILAYER MAGNETIC HEAD CORE

Takeo Sata; Masayuki Takamura; Tomoo Yamagishi; Toshiharu Hoshi, and Kenzaburo Iijima, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 7, 1978, Ser. No. 894,607
Claims priority, application Japan, Apr. 13, 1977, 52-42436
Int. Cl.[3] G11B 5/16, 5/14
U.S. Cl. 360—126 3 Claims



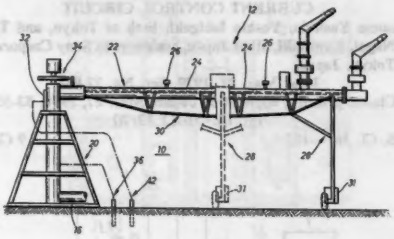
1. A multilayer magnetic head core comprising a plurality of adjacent parallel layers, each layer having a given area of each major surface thereof and comprising an insulating material selected from the group consisting of alumina, magnesia and silica glass; and a unitary sintered mass comprising a low ductility metallic high permeability magnetic alloy material surrounding said layers and forming a plurality of mechanically and electrically interconnected magnetic layers contiguous with corresponding areas of said layers, said mass having a predetermined cross-sectional area in a plane parallel to the major surface of said layers.

4,242,712

OVER-POWER SAFETY DEVICE FOR MOTOR DRIVEN SYSTEM

Joseph D. Doll, Gering, Nebr., assignor to Lockwood Corporation, Gering, Nebr.

Continuation of Ser. No. 789,890, Apr. 22, 1977, Pat. No. 4,138,705. This application Oct. 12, 1978, Ser. No. 950,837
The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.
Int. Cl.[2] H02H 9/04
U.S. Cl. 361—42 1 Claim



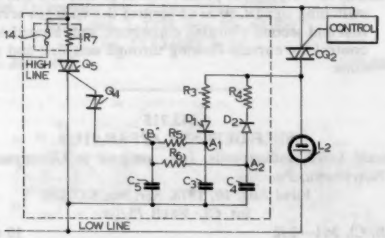
1. A safety device for detecting a fault condition on a chassis of a motor driven system and for interrupting operation of the system upon the occurrence of said condition, said system having means responsive to a control signal for selectively deenergizing the system, said safety device comprising:
a. a first connection to earth ground;
b. a second connection to earth ground spaced from said first connection;
c. a connector between said first connection and said chassis of said system; and
d. a signal generator connected to said second connection and to said chassis for generating the control signal when the voltage between the chassis and the second connection exceeds a selected value.

4,242,713

TRIAC OUTPUT ASYMMETRY DETECTOR

Raymond H. Lewis, Jr., 717 N. "K" St., Lake Worth, Fla. 33460; Edward W. Goodrich, 222 Caribbean Rd., Palm Beach, Fla. 33480, and Dale W. Kline, 3851 Buttercup Cir., Palm Beach Gardens, Fla. 33410

Filed Oct. 25, 1979, Ser. No. 84,924
Int. Cl.[3] H02H 3/26
U.S. Cl. 361—86 6 Claims



1. A protective circuit for an AC driven load having a semiconductor load control element coupled to an AC Power source, said protective circuit comprising:
means for detecting an asymmetrical control element output voltage of either polarity coupled to the output of said load control element, said detecting means including voltage summing point means for summing the positive and

negative voltage half wave outputs from the output of said load control element; and

means responsive to a positive or negative voltage build up above a predetermined amount on said summing point means for providing an indication that the control element output voltage to the load is asymmetrical; and

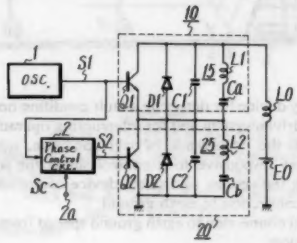
means coupled to said detecting means, responsive to a detected asymmetrical voltage of either polarity for providing an indication that the control element output voltage to the load is asymmetrical.

4,242,714

CURRENT CONTROL CIRCUIT

Susumu Yoshida; Yoshio Ishigaki, both of Tokyo, and Tamiji Nagai, Kawasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,868
Claims priority, application Japan, Mar. 27, 1978, 53-35001
Int. Cl.³ H01J *29/70*
U.S. Cl. 361—152 **9 Claims**



1. A current control circuit comprising:

first and second switching means;

a first resonant circuit connected in parallel with said first switching means and including a first coil and a first capacitor;

a second resonant circuit connected in parallel with said second switching means and including a second coil and a second capacitor;

a first charging capacitor connected in series with said first coil;

a second charging capacitor connected in series with said second coil;

means for connecting said first and second resonant circuits in series with each other with respect to a power supply;

means for applying first and second switching signals of the same frequency to said first and second switching means, respectively; and

means for varying the phase relation of said first and second switching signals, so as to control the voltages across the first and second charging capacitors, and, accordingly, to control the current flowing through said first and second coils.

4,242,715

SELF-DEFENSE APPARATUS

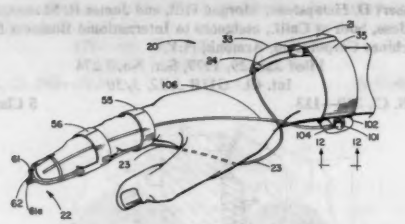
Gerald Laird, Indianapolis, Ind., assignor to Ultradyne, Inc., Norristown, Pa.

Filed Aug. 10, 1978, Ser. No. 932,539
Int. Cl.³ F41B *15/04*
U.S. Cl. 361—232 **10 Claims**

1. A self-defense apparatus to be worn by the user which comprises:

a self-contained, high-voltage-producing module securable to a hand of the user; and

a finger probe device electrically coupled to said high-voltage-producing module and suitably arranged to be worn on a finger of said hand, said finger probe device including a pair of electrically conductive prongs and a layer of electrical insulating material disposed between said finger and said pair of prongs, said prongs being designed and



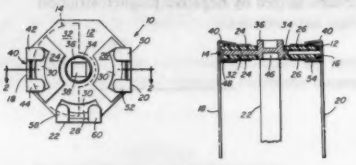
arranged into a pointed configuration and outwardly protruding from said layer a distance sufficient to enable said prongs to penetrate at least one layer of clothing.

4,242,716

DIFFERENTIAL DISC CAPACITOR

John E. Johanson, and Norman E. Johanson, both of Boonton, N.J., assignors to Johanson Manufacturing Corporation, Boonton, N.J.

Filed Mar. 26, 1979, Ser. No. 23,560
Int. Cl.³ H01G *5/06*
U.S. Cl. 361—299 **22 Claims**



1. A tunable differential disc capacitor, comprising:

(a) a pair of outer dielectric discs comprising respective central openings and outwardly facing first surfaces;

(b) an electrically conductive rotor element interposed between said discs in face-to-face relation therewith;

(c) plural electrically conductive portions disposed on each of said dielectric disc first surfaces, said conductive portions of one of said dielectric discs being in substantial spaced parallel registration with said conductive portions of the other of said dielectric discs, so as to provide paired conductive portions;

(d) spring clamp means for retaining said outer dielectric discs in mutually substantially fixed relation and in face-to-face stacked relation with respect to said rotor element;

(e) said rotor comprising a flat segmental rotor plate portion and means constraining said rotor to coaxial rotative movement with respect to said dielectric discs;

(f) said spring clamp means comprising first and second spring clamp electrode members that each comprise a base portion and a clamp finger portion, said base portions of said first and second said electrode members being electrically and mechanically connected with, respectively, first and second said conductive portions of one of said dielectric discs, said clamp finger portions of said first and second said electrode members being electrically and mechanically connected with, respectively, first and second said conductive portions of the other of said dielectric discs, said first and second conductive portions of said one dielectric disc being in substantial registry with said first and second conductive portions of said other dielectric disc

(g) said spring clamp means further comprising a third electrically conductive spring clamp electrode member that

includes a base portion that is electrically and mechanically connected with a third said conductive portion of said one dielectric disc, said third electrically conductive spring clamp electrode member further comprising spring contact means connected to said base portion and electrically contacting a central portion of said rotor element at the region of said central opening of said one dielectric disc, said third spring clamp electrode member also comprising clamp finger portions electrically and mechanically connected with a third said conductive portion of said other dielectric disc, said respective third conductive portions of said dielectric discs being in substantial registry with each other;

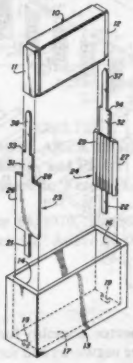
(h) said rotor element comprising a central post portion integrally formed with said segmental rotor plate portion, said central post portion comprising a first axially outwardly-extending portion rotatively journaled in said opening of said one dielectric disc and a second outwardly-extending portion rotatively journaled in said opening of said other dielectric disc, said spring contact means electrically contacting said first axially outwardly-extending portion of said central post portion.

4,242,717

BOXED METALLIZED FILM CAPACITOR

John F. Saban, Downers Grove, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,151
Int. Cl.[3] H01G *1/02, 1/14*
U.S. Cl. 361—308 **1 Claim**



1. A capacitor assembly, comprising

a box having one open side and a pair of spaced holes formed in the bottom of the box in proximity to the juncture of the bottom and a pair of opposed side walls;

a pair of terminals mounted within said box, said terminals having leg sections extending into said holes to position the terminals along said opposed side walls and wide sections facing each other and integral with the leg sections to form shoulders abutting the bottom of the box, said wide sections having protuberances projecting from facing surfaces, said wide sections being joined to intermediate wide sections that extend beyond the open side of the box to act as standoffs which are joined at shoulders to narrower lead sections which may be joined to external circuitry; and

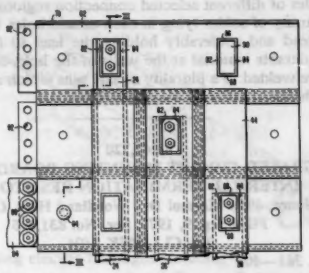
a capacitor blank having terminal pads of a deformable metal, said capacitor mounted in said box with the faces of the terminal pads abutting the said wide sections and deformed in accordance with the configuration of said protuberances.

4,242,718

CONTROL CENTER WITH INTERFITTING DIELECTRIC BARRIERS FOR BUS BARS

Sadiq A. Shariff, Palos Park; John R. Wilson, Darien; Brij M. Bharteey, Bolingbrook, and Neal E. Rowe, Oak Forest, all of Ill., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1979, Ser. No. 11,985
Int. Cl.[3] H02B *1/04*
U.S. Cl. 361—341 **6 Claims**



1. A control center for distributing electric power from a power supply source to power consuming devices, comprising:

a plurality of cabinets having a plurality of vertically spaced compartments in each cabinet;

a set of a plurality of vertical, horizontally spaced, bus bars in each cabinet;

a set of a plurality of horizontal, vertically-spaced, bus bars in each cabinet and electrically connected to corresponding vertical bus bars;

a dielectric barrier on each side of at least one of the sets of horizontal and vertical bus bars and the barrier on each side comprising a number of barrier sections disposed along the length of the bus bars and in surface-to-surface contact therewith;

the barrier sections being sheet-like members having opposite side, edge, and end surfaces;

first cooperating interfitting means including first tonque and groove members extending from facing side surfaces of each barrier and between the bus bars of each set of bus bars; and

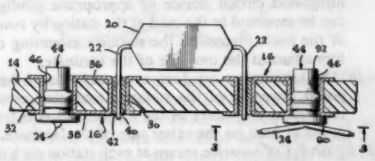
second cooperating interfitting means including second tongue and groove members along the abutting end portions of the adjacent barrier sections.

4,242,719

SOLDER-WELD P.C. BOARD APPARATUS

Larry R. Conley, Fountain Valley, Calif., assignor to Interconnection Technology, Inc., Costa Mesa, Calif.

Filed Jun. 1, 1979, Ser. No. 44,404
Int. Cl.[3] H05K *1/18*
U.S. Cl. 361—400 **7 Claims**



1. A solderable and weldable circuit board apparatus comprising:

a base board having a multiplicity of holes therein;

a layer of solderable material disposed on said base board and forming a plurality of separate connection regions, the layer in each of said regions plating a plurality of holes and an area on said base board which connects the holes;

a plurality of pins of weldable material, each lying in a selected one of said holes and in press-fit contact with the layer of solderable material on the walls of the hole, each pin having an electrode-engageable end to enable the welding of a wire thereto;

each of said connection regions having at least one hole which holds one of said pins and at least one other hole which is devoid of a pin to enable a lead to be soldered therein;

a circuit component having a plurality of leads disposed in holes of different selected connection regions;

a quantity of solder lying in each of said holes which holds a lead and solderably holding the lead to the layer of solderable material at the walls of the hole; and

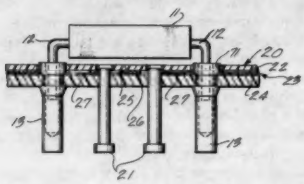
a wire welded to a plurality of said pins which are disposed in holes of different connection regions.

4,242,720

INTEGRATED CIRCUIT MOUNTING BOARD HAVING INTERNAL TERMINATION RESISTORS

Donn Moore, 4950 Marmol Dr., Woodland Hills, Calif. 91364

Filed Sep. 9, 1977, Ser. No. 831,895
Int. Cl.³ H05K 1/04
U.S. Cl. 361—402 **29 Claims**



1. A logic card for mounting of integrated circuit devices thereto and for selective interconnection of mounted integrated circuit devices, the card comprising

(1) a laminate which includes a relatively highly conducting layer,

(2) a plurality of conductors carried by the laminate at each of a plurality of integrated circuit device mounting stations defined on one of two opposite sides of the laminate, the conductors comprising a first group of termination conductors and a second group of mounting conductors at each station,

(a) the mounting conductors at each station being effectively exposed on the opposite sides of the laminate and disposed out of contact with the conductive layer, the mounting conductors at each station being disposed to define substantially the boundary of the station and disposed in a selected pattern corresponding to the arrangement and relative spacing of a corresponding plurality of conductive leads from an integrated circuit device of specified external configuration, whereby an integrated circuit device of appropriate configuration can be mounted to the card at the station by connection of the leads thereof to the station's mounting conductors adjacent the one side of the laminate,

(b) the termination conductors at each station being disposed inwardly of the station's mounting conductors relative to the center of the station and effectively exposed at least on the other side of the laminate,

(3) a plurality of separate means at each station each defining a transmission line termination device, the number of said separate means at each station being equal to the number of termination conductors at the station, each said separate means being carried by the laminate as a part thereof within the boundary of the corresponding station, and means conductively connecting each of said separate means at each station to the laminate conductive layer and to a respective one of the termination conductors, whereby an integrated circuit device mounted at one station adjacent the one side of the laminate can be connected to receive a signal from another device similarly mounted at another station by a conductor disposed adjacent the opposite side of the laminate and connected

(a) between selected ones of the second group conductors at each of the two stations and

(b) to any one of the first group conductors at the one station, and

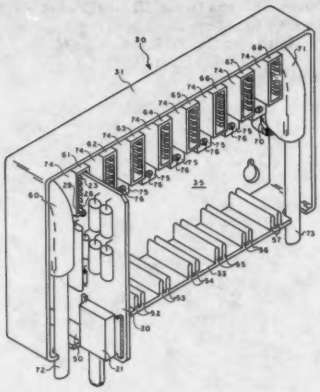
(4) connection means conductively connected to the laminate conductive layer and accessible to the exterior of the laminate at a selected location on the card adapting the card for application of a selected potential to the laminate conductive layer.

4,242,721

ELECTRICAL CONNECTOR ASSEMBLY FOR INTERCONNECTING REMOTE SIGNAL STATIONS TO CENTRAL SIGNAL PROCESSING SYSTEMS

Ronald F. Krolak, North Riverside; Jay Perna, Naperville, and Frederick J. Radloff, Northlake, all of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 20, 1977, Ser. No. 843,923
Int. Cl.³ H05K 7/14
U.S. Cl. 361—415 **38 Claims**



1. An electrical connector assembly for selectively receiving a plurality of impedance networks and for selectively interconnecting a plurality of remote signal stations having predetermined signal characteristics to a central signal processing system, comprising:

housing means including plural sidewalls and a bottom wall for defining a receiving cavity;

first multiple contact means within said cavity including a first plurality of contacts adapted for connection to the central signal processing system;

second multiple contact means within said cavity including a second plurality of contacts correspondingly associated with said first plurality of contacts and adapted for connection to the remote signal stations;

a plurality of intermediate multiple contact means within said cavity, each said intermediate multiple contact means including a third plurality of contacts correspondingly associated with said first and second plurality of contacts and adapted for selective and independent connection to an impedance network;

circuit means within said cavity for interconnecting corresponding contacts of said first, second and third plurality of contacts and for interconnecting correspondingly associated remote signal stations to the central signal process-

ing system as each said third plurality of contacts is coupled to an impedance network;

support means within said cavity for supporting the impedance networks within said housing means; and

one of said sidewalls being associated with said second multiple contact means and said housing including a partition wall spaced from said one sidewall with said support means being associated with said partition wall.

4,242,722

CAPACITOR CONTAINING ANTHRANILATE ELECTROLYTE

Sidney D. Ross, Williamstown; Manuel Finkelstein, North Adams, and Franz S. Dunkl, Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 21, 1979, Ser. No. 22,553
Int. Cl.³ H01G 9/02
U.S. Cl. 361—433 **2 Claims**

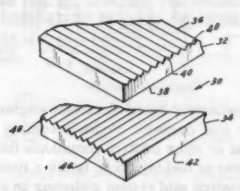
1. An electrolytic capacitor comprising a formed anode electrode, a cathode electrode, interleaved spacers therebetween, and as liquid electrolyte in contact therewith, 4.1 to 15.7 wt% of ammonium anthranilate dissolved in a polar organic solvent selected from the group consisting of ethylene glycol and ethylene glycol mixed with butyrolactone, methyl carbitol, N,N-dimethylformamide, 3-ethyl-2-oxazolidone, 3-methoxypropionitrile, dimethylsulfoxide, said electrolyte containing 1 to 10 wt% water and having a room-temperature resistivity of 254 to 584 Ω-cm.

4,242,723

LOW LEVEL WORK AREA LIGHTING SYSTEM

William C. Fabbri, Billerica, and Paul T. Metcalf, II, Methuen, both of Mass., assignors to Keene Corporation, New York, N.Y.

Filed May 14, 1979, Ser. No. 38,642
Int. Cl.³ A61G 13/00
U.S. Cl. 362—33 **6 Claims**



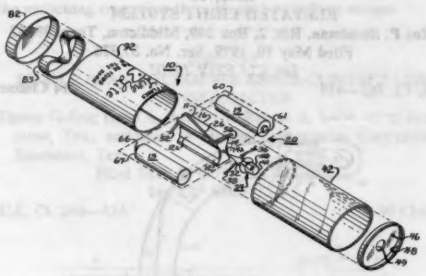
1. A work area lighting system comprising: a housing positioned above a work area, said housing having an open-bottom end; a linear light source mounted within said housing; a refractor for providing substantially uniform light distribution over the work area in the direction parallel to said light source as well as the direction transverse to the light source, said refractor comprising a pair of overlying plate members mounted to said housing closing said open bottom end, said refractor including first and second refractor plate members each substantially co-extensive in length with said light source; said first plate member having a light incident surface comprising a plurality of spaced prisms extending parallel to said linear light source; and said second plate member having a light incident surface comprising a plurality of spaced prisms extending perpendicular to said linear light source.

4,242,724

DISPOSABLE FLOATING FLASHLIGHT

Wilfred S. Stone, 204-6 S. 13th Ave., St. Charles, Ill. 60174

Filed Apr. 27, 1979, Ser. No. 34,066
Int. Cl.³ F21L 7/00
U.S. Cl. 362—158 **12 Claims**



1. A floating electric flashlight including

a sealed water-resistant casing defining a flotation chamber and including an air chamber portion at each end of said casing having substantially equal volumes of air confined therein for maintaining and balancing the flotation of said flashlight in a predetermined orientation when placed in water,

electrical energy producing storage means for providing a source of electrical energy and an electrically energizable light bulb carried within said casing,

said storage means and said light bulb coupled into an electrical circuit for connecting the electrical energy from said storage means to said light bulb for effecting the illumination thereof, and

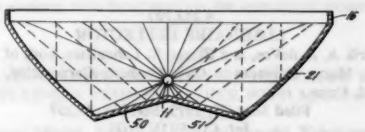
normally open switch means carried entirely within said casing, and coupled into said electrical circuit and operable into a closed position upon flexing said casing for coupling the electrical energy from said storage means to said light bulb thereby effecting the illumination thereof.

4,242,725

LIGHT REFLECTOR STRUCTURE

William L. Douma, West Paterson, and Ward E. Brigham, Rutherford, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

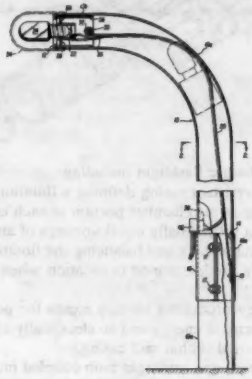
Filed Dec. 1, 1977, Ser. No. 856,279
Int. Cl.³ H02B 1/20
U.S. Cl. 362—341 **8 Claims**



1. A reflector for producing a uniform distribution of radiation over a given area comprising: a lamp elongated along a straight line and a modified parabolic reflector extending substantially coextensively with said lamp; said lamp being supported generally parallel to and within a relatively short distance of the focal line of said reflector; said reflector defining a parabolic surface except in the central surface region of said reflector, and said central surface region of said reflector being uniformly and symmetrically distorted inwardly toward said lamp and away from said parabolic surface defined by the undistorted regions of said reflector, for modifying the intensity distribution of radiation reflected by said reflector from one having increased intensity toward the laterally central

regions of said reflector to one having a more even lateral intensity distribution.

4,242,726
ELEVATED LIGHT SYSTEM
Rufus P. Steadman, Rte. 2, Box 249, Middleton, Tenn. 38052
Filed May 10, 1979, Ser. No. 37,976
Int. Cl.³ F21V *19/02*
U.S. Cl. 362—418 **14 Claims**

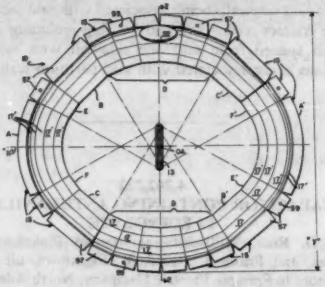


1. In a composite assembly of an elevated and stabilized standard, as a tower or pole structure to carry a light or other signal fixture for street and highway lighting; the provision of a carriage carrying the fixture and associated with the standard for movement substantially along the length thereof between a lower accessible position permitting repair, replacement or other servicing of the fixture and an upper position with the fixture in operative location; and elongate actuating means with permissive lateral flexing connected to the carriage and extending from the upper position thereof along the standard in at least partially laterally confined association therewith to a lower accessible position for service personnel to manipulate the same for lowering and raising the carriage with the included fixture.

4,242,727
LUMINAIRE REFLECTOR
Hendrik A. J. deVos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Mar. 29, 1979, Ser. No. 25,257
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—346 **16 Claims**

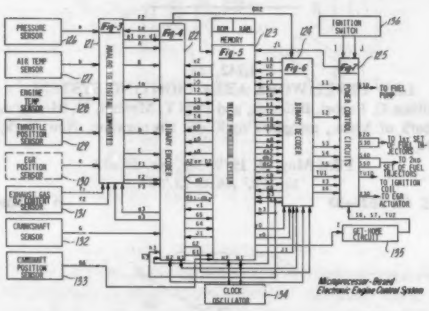
1. A concave reflector for being positioned within a luminaire having an elongated light source therein and adapted for illuminating a subject field located an established distance therefrom, said reflector comprising:

a plurality of adjoining segment members defining a forward opening for said reflector and adapted for substantially surrounding said elongated light source, each of said segment members including a plurality of reflective facets thereon, said facets arranged to reflect light from said elongated light source through said forward opening of said reflector and produce a substantially rectangular, controlled pattern of light on said subject field, each of said segment members arranged such that the facets thereof reflect light primarily onto only a preselected



portion of said rectangular pattern of light on said subject field.

4,242,728
INPUT/OUTPUT ELECTRONIC FOR MICROPROCESSOR-BASED ENGINE CONTROL SYSTEM
Thomas W. Hartford, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed Feb. 27, 1978, Ser. No. 881,323
Int. Cl.³ F02D *21/04*; F02M *25/06*; G06F *7/70*
U.S. Cl. 364—431 **10 Claims**



1. A microprocessor-based electronic engine control system responsive to one or more engine-operating parameters for generating one or more control commands for operating such engine functions as fuel injection, ignition timing, and proportional EGR control, said system including an engine having an intake system, an exhaust system, conduit means for operatively connecting said exhaust system to said intake system for recirculating exhaust gases back to said intake system to modify the air-fuel ratios existing therein, an EGR valve disposed at least partially within said conduit means and responsive to an EGR control signal for selectively increasing and decreasing the quantity of exhaust gases recirculated back to said intake system, said electronic engine control system further including a microprocessor, memory means operatively associated with said microprocessor, means for sensing the actual relative position of said EGR valve and generating a digital word indicative thereof, the improvement comprising memory means storing data representative of a look-up table of modifier values which are a function of at least EGR valve positions stored in said memory means and addressable by said digital word, program storage means implemented by said micro-

processor and responsive to sensed engine-operating parameters for calculating a desired EGR valve position and generating a computer-calculated EGR command indicative thereof, means responsive to said EGR command for generating a count indicative thereof and counter means for initially storing said count and decrementing same to produce an EGR pulse-width output signal in response thereto for selectively re-positioning said EGR valve.

2. In a microprocessor-based engine control system including a microprocessor means, memory means for storing a program for implementing at least one control law, said microprocessor being responsive to one or more engine operating parameters for normally generating fuel injection commands, the improvement comprising:

means for detecting a failure in said system and for generating a signal indicative thereof;

means responsive to said failure indicative signal for generating a series of limp home fuel control pulses sufficient to enable the vehicle to travel a short distance for repairs;

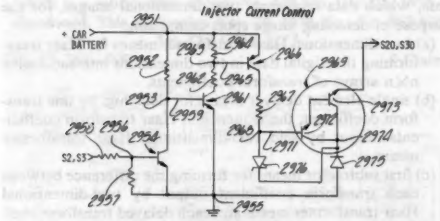
said means for generating said series of "limp home" fuel control pulses includes one-shot multivibrator means responsive to the generation of each of said engine position pulses for generating a corresponding "limp home" fuel control pulse, RC circuit means operatively coupled to said one-shot multivibrator means for determining the pulse duration of said "limp home" fuel control pulses, and pulse transmission gating means coupled to the output of said one-shot multivibrator means for receiving said "limp home" fuel control pulses whose generation is triggered by the generation of said engine position pulses, said transmission pulse gating means normally preventing said fuel injection means from receiving said "limp home" fuel control pulses but being responsive to the presence of said "fail" signal for passing said "limp home" fuel control pulses to said fuel injection means and enabling said "limp home" pulses to control the injection of fuel into said engine in spite of a failure in some portion of said microprocessor-based engine control system which might affect the reliability of said normally-generated fuel injection commands.

4,242,729

SWITCHING CONTROL OF SOLENOID CURRENT IN FUEL INJECTION SYSTEMS

Robert E. Weber, Newport News, and Patrick D. Harper, Seaford, both of Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,324
Int. Cl.[3] G05B *11/26*; F02M *51/00*; H03K *3/281*
U.S. Cl. 364—431 **1 Claim**



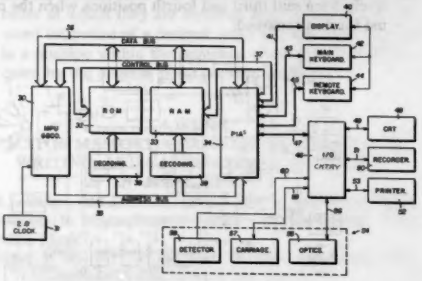
1. A control system for controlling the application of electrical energy from a source to a fuel injector means for an internal combustion engine including at least one solenoid-operated valve, each of said at least one solenoid-operated valve including a solenoid which is responsive to the supply of current thereto for producing relatively fast-acting valve openings and closings for precision control of the quantity of fuel injected by said solenoid-operated valve, and an electronic engine control system for generating a fuel control pulse indicative of a computed value of fuel to be injected into said engine, said control system comprising means connected between the electrical energy and the solenoid for switchably controlling the flow of current in said solenoid to minimize power consumption in response to the fuel control pulse, and a free-wheeling diode means connected in series with said switching means, said diode means and said switching means connected across the solenoid for maintaining current flow in said solenoid during the switching operation through said switching means.

4,242,730

SINGLE SCAN MICROPROCESSOR-CONTROLLED DENSITOMETER

Tipton Golias; Gene A. Butts, and Robert A. Swift, all of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Mar. 9, 1979, Ser. No. 19,041
Int. Cl.[3] G06F *15/42*
U.S. Cl. 364—416 **30 Claims**



1. A method of graphically displaying optical density patterns of a sample of blood or the like for subsequent evaluation comprising the steps of:

optically scanning a sample a single time to generate a time-varying analog waveform which is a function of the optical density of the scanned sample;

converting the generated analog waveform into a set of digital signals;

storing the set of digital signals in memory as raw sample data;

retrieving said stored raw sample data to reproduce said time-varying analog waveform and displaying a normalized version of said analog waveform on a CRT device for visual operator inspection without rescanning said sample;

editing the visually displayed normalized analog waveform to selectively modify portions thereof; and

recording a graphical trace of said edited normalized analog waveform on a fixed medium for subsequent evaluation.

4,242,731

NAVIGATIONAL INFORMATION INDICATOR FOR SUPPLYING A VEHICLE DRIVER WITH MAKE-TURN INSTRUCTIONS

Masanori Mizote, Yokosuka; Kiyoshi Yamaki, Yokohama, and Takashi Oka, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Japan

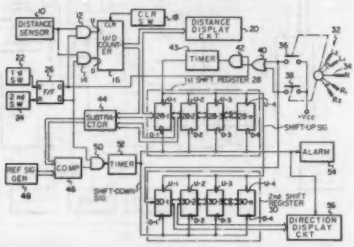
Filed Jan. 24, 1979, Ser. No. 6,113
Claims priority, application Japan, Jan. 25, 1978, 53-6826
Int. Cl.[3] G06F *15/50*
U.S. Cl. 364—436 **9 Claims**

1. A navigational information indicator for supplying a vehicle driver with make-turn instructions, comprising:

(a) first means for producing a first signal indicative of the distance travelled by said vehicle from a starting point when the vehicle is driven from said starting point toward an objective point, and a second signal indicative of the distance remaining to said starting point when the vehicle

is driven back from said objective point toward said starting point;

(b) second means for producing a third signal indicative of the direction of each turn of said vehicle, said second means comprising a turn signal switch including a pivotable lever, said lever being manually pivotable selectively in clockwise and counterclockwise directions from a neutral position to respectively assume first and second positions for producing right and left turn signals, said lever being further pivotable by manual force selectively in said clockwise and counterclockwise directions beyond said first and second positions to respectively assume third and fourth positions, and switching means operated by said lever to (1) produce a first turn signal indicative of a right turn, as said third signal, when said lever assumes said third position, and (2) produce a second turn signal indicative of a left turn, as said third signal, when said lever assumes said fourth position, said lever automatically returning to said first and second positions respectively from said third and fourth positions when the manual force is removed;



(c) third means for sequentially storing information indicated by said first signal during turning;

(d) fourth means for sequentially storing information indicated by said third signal during turning;

(e) fifth means for controlling the storing function of said third and fourth means, said fifth means including said switching means which produces one of said turn signals when said lever of said turn signal switch assumes either one of said third and fourth positions;

(f) sixth means responsive to information read out from said third means in the reverse sequence with respect to which it was stored and to said second signal indicative of the remaining distance, said sixth means producing a fourth signal which triggers said fourth means to read out a piece of information from said fourth means in the reverse sequence with respect to which it was stored when the remaining distance has a predetermined relationship with respect to a distance indicated by said read out information; and

(g) seventh means for visually displaying a navigational sign in accordance with the information read out from said fourth means.

4,242,732

COMMUTATING NARROWBAND FILTER

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

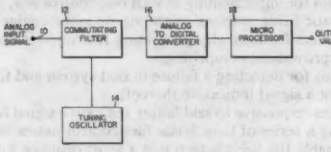
Filed Feb. 5, 1979, Ser. No. 9,206
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—485 **5 Claims**

4. A narrowband filter having a digital output, comprising:

a commutating filter means which includes a plurality of RC networks to which an input analog signal to be filtered is commutated at a commutation frequency, having a first input for receiving the input signal, a second input, and an output for providing a series of discrete voltages taken sequentially from the RC networks;

a variable frequency means connected to the second input of the commutating filter for selecting the commutation frequency;

an analog to digital conversion means having an input connected to the output of the commutating filter and having an output for converting said series of discrete voltages into a series of digital words; and



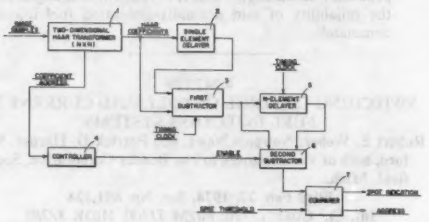
a processing means having an input connected to the output of the conversion means and having an output for processing the digital words by use of a Discrete Fourier Transform to compute the spectral content of the input signal at the selected commutation frequency, and for providing a digital representation of the spectral content of the input signal in a frequency band centered on the commutation frequency.

4,242,733

IMAGE SPOT DETECTOR USING HAAR COEFFICIENTS

Bruce C. Deal, Santa Ana, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 27, 1979, Ser. No. 69,882
Int. Cl.³ H04N *7/12*; G06F *15/332*
U.S. Cl. 364—515 **2 Claims**



1. A machine for processing successive n×n arrays of digital data, which data represents two-dimensional images, for the purpose of detecting image spots comprising:

(a) two-dimensional Haar transformer means for Haar transforming the digital data in two dimensions into successive n×n arrays of transform coefficients,

(b) single element delayer means for delaying, by one transform coefficient, the sequence of Haar transform coefficients output by said two-dimensional Haar transformer means,

(c) first subtractor means for forming the difference between each transform coefficient output by two-dimensional Haar transformer means and each delayed transform coefficient output by said single element delayer means,

(d) n-element delayer means for delaying the difference output by first subtractor means,

(e) second subtractor means for forming the difference between each difference output by first subtractor means and each delayed difference output by n-element delayer means,

(f) controller means for receiving the coefficient addresses output by two-dimensional Haar transformer means and outputting an enabling signal to second subtractor means for those double differences that are sensitive to spots, said

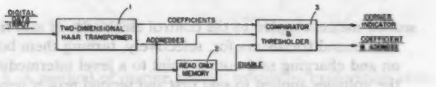
second subtractor means outputting a double difference only when enabled by controller means, and

(g) comparer means containing a preselected threshold for comparing the output of said second subtractor means to the threshold and outputting a spot indication and its address whenever the absolute magnitude of the output of second subtractor means exceeds the threshold.

4,242,734
IMAGE CORNER DETECTOR USING HAAR COEFFICIENTS

Bruce C. Deal, Santa Ana, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Aug. 27, 1979, Ser. No. 69,883
Int. Cl.³ H04N 7/12; G06F 15/332
U.S. Cl. 364—515 **3 Claims**



1. A machine for processing successive n×n arrays of digital data, which data represents two-dimensional images, for the purpose of detecting image corners comprising:

(a) two-dimensional Haar transformer means for Haar transforming the digital data in two dimensions into successive n×n arrays of transform coefficients,

(b) comparator and thresholder means having a preselected threshold set therein,

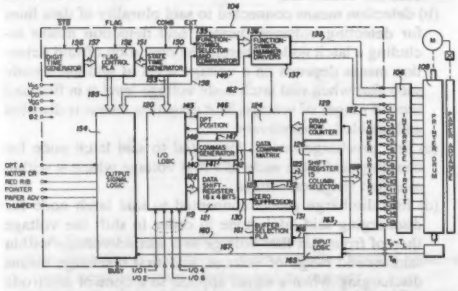
(c) a read-only memory containing a list of transform coefficients that are sensitive to corners, the output of said read-only memory being fed to said comparator and thresholder means,

(d) said comparator and thresholder means comparing the preselected threshold with the absolute magnitude of each of the transform coefficients that are sensitive to corners, and outputting an indication of a corner together with the transform coefficient and its address whenever the absolute magnitude of the transform coefficient exceeds said preselected threshold.

4,242,735
CALCULATOR-PRINTER INTERFACE WITH NUMERICAL STRING SEGMENTATION

Joe F. Sexton, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 680,834, Apr. 28, 1976, abandoned, which is a continuation of Ser. No. 429,336, Dec. 28, 1973, abandoned. This application Nov. 20, 1978, Ser. No. 962,420
Int. Cl.³ G06F 3/12
U.S. Cl. 364—900 **9 Claims**



1. In a printer control system for controlling the printing of a set of numerals and a decimal point in response to a sequence of multibit data words including a decimal point position word indicating the position of a decimal point followed by a plurality of numeral words indicating respective numerals of the set of numerals, the combination comprising:

(a) an input means for receiving the sequence of data words;

(b) a first clock pulse generating means for generating a first series of clock pulses at a first predetermined rate;

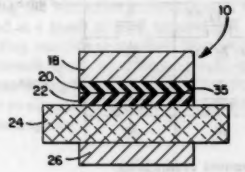
(c) a shift register connected to said first clock pulse generator having a plurality of sections equal in number to the number of bits in the multibit data words, each section including a predetermined number of sequentially connected elements, said predetermined number being at least as great as the number of data words in the sequence of data words, said shift register for storing data words in a set of corresponding elements in each of said plurality of sections and for shifting said stored data words along said sequence of elements at said first predetermined rate of said first series clock pulses; and

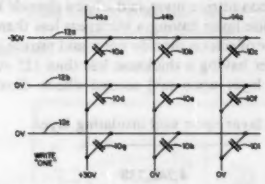
(d) a logic gate means, connected to said input means and said shift register, for entering numeral words received by said input means into said shift register one at a time in the order in which they are received and for entering a data word indicative of a decimal point into said shift register in a position within the sequence of numeral words indicated by the decimal point position word.

4,242,736
CAPACITOR MEMORY AND METHODS FOR READING, WRITING, AND FABRICATING CAPACITOR MEMORIES

Jack I. Raffel, and John A. Yasaitis, both of Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 737,165, Oct. 29, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,551
Int. Cl.³ G11C 7/00, 11/24
U.S. Cl. 365—191 **34 Claims**





1. The process of writing in a capacitor memory array, the array comprising a plurality of isolated capacitor cells, each cell including at least a first conductive layer, a first dielectric insulating layer, a second dielectric insulating layer, a doped semiconductor layer, and a second conductive layer, the first conductive layers of said cells being grouped and interconnected into a plurality of word lines and the second conductive layers of said cells being grouped and interconnected into a plurality of bit lines, one each of said bit and word lines uniquely identifying a capacitor cell, and each cell having two capacitor states, the process including the steps of

applying to at least one selected cell of said memory array a

first potential (a) having a polarity to drive a portion of the substrate of said cell into depletion, (b) having a sufficient magnitude to effect avalanche breakdown in said depletion portion of the substrate of said cell, and (c) having sufficient magnitude and duration to change the state of said cell and simultaneously

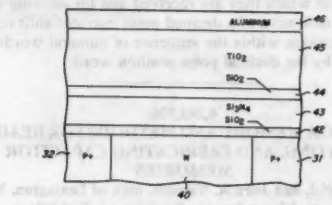
applying to unselected cells of said memory array at least a second potential having a magnitude and duration insufficient to change a state of said unselected cells.

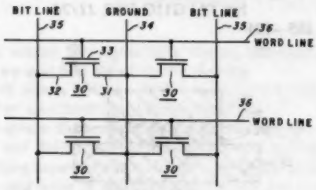
4,242,737

NON-VOLATILE SEMICONDUCTOR MEMORY ELEMENTS

Robert T. Bate, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 27, 1978, Ser. No. 963,855
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—184 **11 Claims**





7. A memory element comprising:

a semiconductor body;

a first layer of silicon dioxide upon said body, said first layer having a thickness less than 150 A;

a layer of silicon nitride upon said silicon dioxide layer, said silicon nitride layer having a thickness less than 750 A;

a second layer of silicon dioxide upon said nitride layer, said second layer having a thickness less than 125 A;

an insulating layer upon said second silicon dioxide layer; and

a conducting layer upon said insulating layer.

4,242,738

LOOK AHEAD HIGH SPEED CIRCUITRY

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 81,040
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **13 Claims**

1. The combination comprising:

first and second power terminals for the application thereto of first and second voltages, respectively;

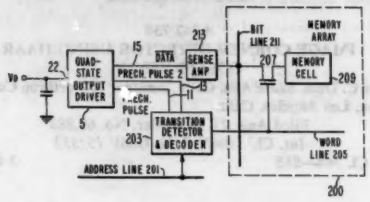
an output point;

first and second transistors, each transistor having a conduction path and a control electrode,

means connecting the conduction path of said first transistor between said first power terminal and said output point;

means connecting the conduction path of said second transistor between said output point and said second power terminal;

a first means coupled to the control electrodes of said first and second transistors for, selectively, turning either one of them on and the other one off and for, selectively, turning them both off; and



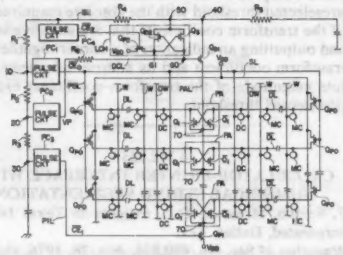
second means coupled to the control electrodes of said first and second transistors for, selectively, turning them both on and charging said output point to a level intermediate the voltages applied to said first and second power terminals.

4,242,739

MEMORY SYSTEM WITH A STABILIZED SENSE AMPLIFIER

Ryoichi Hori, Hinodemachi, and Kiyoo Itoh, Higashi-kurume, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 2, 1979, Ser. No. 26,188
Claims priority, application Japan, Mar. 31, 1978, 53-36774
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—203 **14 Claims**



1. A memory system comprising:

(a) a plurality of data lines to which a plurality of memory cells are connected;

(b) detection means connected to said plurality of data lines for detecting voltages thereof, said detection means including a latch node, wherein the operation of said detection means depends on a voltage level of said latch node such that when said latch node voltage level is in first and second ranges of voltage, said detection means is disabled and enabled, respectively;

(c) first precharge means connected to said latch node for charging said latch node to a first voltage which is within said first range of voltage;

(d) first discharge means connected to said latch node for discharging said latch node in order to shift the voltage thereof from said first voltage to a second voltage within said second range of voltage, said first discharge means discharging when a signal applied to a control electrode thereof has a level above a predetermined threshold value;

(e) means for generating a first pulse signal having first and second levels; and

(f) transformation means connected to said generating means

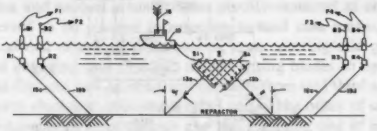
and said control electrode of said first discharge means for transforming said first pulse signal into a second pulse signal which has levels lower and higher than said threshold value when said first pulse signal has said first and second levels, respectively.

4,242,740

SEISMIC REFRACTION EXPLORATION

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,100
Int. Cl.³ G01V *1/13, 1/38*
U.S. Cl. 367—15 9 Claims



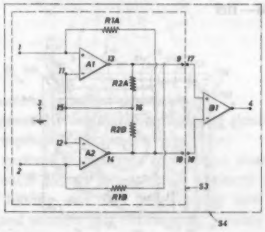
1. A method of marine seismic refraction exploration comprising the steps of:
(a) estimating the maximum and minimum of emergent angles for refracted acoustic energy that will travel from subsurface layers to a surface to be traversed by a line of exploration,
(b) determining the angular difference between said minimum and said maximum emergent angles,
(c) providing an elongated array of spaced seismic sources for movement along said line of exploration and having a length such as to produce a lobe of seismic energy whose points representing half power response subtend with respect to the vertex of said lobe an angle approximate to the value of said angular difference,
(d) generating with said array said lobe of seismic energy,
(e) rotating said lobe of seismic energy to a position so that points defining said half power response fall respectively on said minimum and said maximum emergent angles,
(f) continuing to generate said lobe of seismic energy,
(g) detecting at the surface acoustic energy emerging from the subsurface layers, and
(h) recording said detected energy as a function of time.

4,242,741

FLOATING SHUNT SEISMIC AMPLIFIER

John F. Parrish, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 19, 1979, Ser. No. 4,644
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—21 22 Claims



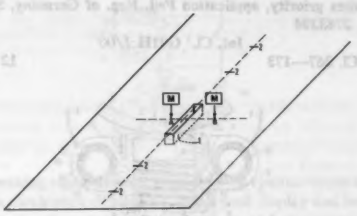
1. A floating shunt amplifier comprising:
two operational amplifiers, each amplifier having positive and negative polarity inputs and an output;
two feedback loops electrically connected to said operational amplifiers, a first feedback loop connecting the output of a first operational amplifier to the positive polarity input of the second operational amplifier, the second feedback loop connecting the output of the second operational amplifier to the positive polarity input of the first operational amplifier, each of said feedback loops including an impedance serially disposed therein; and,
means connected to said negative polarity inputs of said operational amplifiers for maintaining said negative polarity inputs at the common mode input potential of said floating shunt amplifier.

4,242,742

PROCESS FOR ELIMINATING LONGITUDINAL WAVE COMPONENTS IN SEISMIC EXPLORATION

Robert J. Garotta, Chatenay Malabry, France, assignor to Compagnie Generale de Geophysique, France

Filed Mar. 9, 1979, Ser. No. 19,034
Claims priority, application France, Mar. 22, 1978, 78 08310
Int. Cl.³ G01V *1/00, 1/28*
U.S. Cl. 367—75 4 Claims



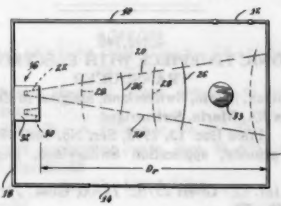
1. A method of seismic exploration, including the steps of
applying to the surface of the soil a plurality of vertical impacts at points separated by a vertical trench cut in the soil,
recording the vibrations propagating in the soil subsequent to and as a result of each impact, and
subtracting recordings resulting from impacts on one side of the trench from recordings resulting from impacts at corresponding locations on the other side of the trench, in order to eliminate the effect of longitudinal waves created by the impacts.

4,242,743

INTRUSION DETECTION METHOD AND APPARATUS

Robert J. Salem, Danbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 9, 1978, Ser. No. 959,236
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—93 14 Claims



1. An improved method for detecting the presence of an intruding object or certain other environmental changes in a protected area, the method comprising the steps of:
(a) projecting a reference pulse of acoustical energy from a source into an area towards a reflective surface therein,
(b) establishing a reference parameter (T_r) having a magnitude proportional to the interval of time elapsed between

projection of said reference pulse and reflection of said reference pulse to a receiver,

(c) projecting a similar pulse of acoustical energy from the source towards the reflective surface,

(d) establishing an elapsed time parameter (T_e) having a magnitude proportional to the interval of time elapsed between projection of said similar pulse and reflection of said similar pulse to the receiver,

(e) comparing the magnitude of the elapsed time parameter (T_e) with the magnitude of the reference parameter (T_r) and sensing for a variation (ΔT) therebetween, and

(f) generating an alarm in response to a variation (ΔT).

4,242,744

FIXING OF SONIC TRANSDUCER TO A CONTAINER

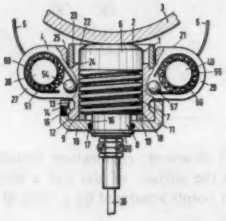
Werner Rottmar, Loerrach, Fed. Rep. of Germany, assignor to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,558

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743394

Int. Cl.³ G01H *1/00*

U.S. Cl. 367—173 **12 Claims**



1. A device for fixing a sonic or ultrasonic transducer to a container, comprising a holder adapted to be applied to the outside of the container and having an internal recess which is open towards the container and in which said transducer is arranged axially displaceable, a first spring mounted in said recess so as to urge said transducer outward towards the container, and a clamping strip extending around the periphery of said container and connected to said holder by connecting members at both sides of said transducer for clamping the holder to the container and for maintaining the transducer in contact with the container, at least one of said connecting members including a tensioning device for tightening said clamping strip, said tensioning device including a second spring for determining the clamping force of said clamping strip without affecting the contact pressure of the transducer with respect to the container.

4,242,745

ELECTRONIC TIMEPIECE WITH ELECTROACOUSTIC TRANSDUCER

Claude Mutrux, Marin, Switzerland, assignor to Ebauches Electroniques SA, Marin, Switzerland

Filed Dec. 13, 1978, Ser. No. 968,919

Claims priority, application Switzerland, Dec. 23, 1977, 15935/77

Int. Cl.³ G04B *23/02, 17/00;* G04C *21/16*

U.S. Cl. 368—73 **6 Claims**

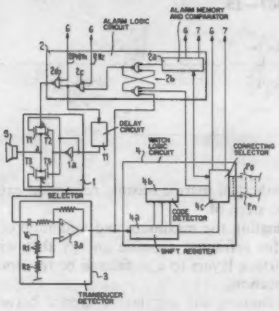
1. An electronic timepiece having an alarm means and including a time base source supplying signals to a display control circuit for controlling a display, comprising:

an electroacoustic transducer capable of emitting acoustic signals of audible frequencies in response to electrical audio frequency output signals and of producing electrical audio frequency input signals in response to received acoustic signals of audible frequencies; and

a watch and transducer control logic network coupled to said time base pulse source, said display control circuit, and said electroacoustic transducer, said control logic network including first means coupled to said time base pulse source for generating said electrical audio frequency output signals;

said control logic network including second means responsive to said electrical audio frequency input signals produced by said transducer for effecting a change in a predetermined operative condition of the timepiece;

said control logic network further including selector means normally operatively connecting said electroacoustic



transducer to said second means whereby said transducer normally functions as a receiver of said acoustic signals of audible frequencies, said selector means further being responsive to activation of said alarm means for alternatively operatively connecting said transducer, alternately to said first means thereby causing said transducer to emit an acoustic alarm signal in response to said electrical audio frequency output signals, and to said second means thereby causing said transducer to receive said acoustic signals, thus permitting at least one operative condition of the timepiece to be controlled by an acoustic signal of audio frequency.

4,242,746

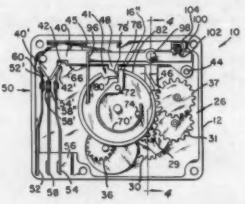
TIMING MECHANISM WITH TWO SEPARATE PROGRAMS OPERATING SEPARATE SWITCH ACTUATORS AND HAVING AN ALARM SYSTEM

Maurice E. Schuder, Indianapolis, and Richard W. Stafford, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 2, 1978, Ser. No. 947,594

Int. Cl.³ G04F *8/00;* G04C *21/16;* H01H *43/10*

U.S. Cl. 368—109 **6 Claims**



1. A timing mechanism having power drive means rotating first and second cam means and a double pole switch means opening and closing to a rotation of said cam means comprising:

(a) coupling means coupling said power drive means to said cam means,

(b) first and second spring blades disposed in substantially parallel relation and having lengths which are substantially equal, first and second electrical contacts one each carried on each of said blades respectively near distal ends thereof and facing each other, a third spring blade disposed between said first and second spring blades and in substantial parallel relation therewith, said third spring blade having a length shorter than the lengths of said first and second spring blades so as to provide a gap between same at said distal ends, and third and fourth electrical contacts carried on opposed surfaces of said third spring blade in operational position with said first and second electrical contacts, and

(c) first and second actuator arms pivotly mounted at ends thereof to be pivoted in response to said cam means, a distal end of one of said actuator arms entering said gap and engaging said first and second spring blades to open said first and second electrical contacts from said third and fourth electrical contacts, a distal end of the other of said actuator arms entering said gap and engaging one of said first and second spring blades to open one of said first and second electrical contacts from one of said third and fourth electrical contacts.

4,242,747

ANALOG-DIGITAL CHRONOMETRIC DISPLAY

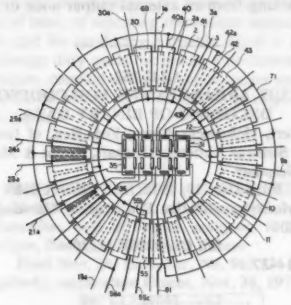
Kurt Fahrenschon, Kelkheim, Fed. Rep. of Germany, assignor to Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,572

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732877

Int. Cl.³ G04B *19/34*

U.S. Cl. 368—242 **9 Claims**



1. A chronometric indicator comprising:

an array of generally angularly equispaced electrodes each having a respective electrode connection;

an array of generally angularly equispaced analog display segments each having a respective segment connection and each having one half overlapping one respective electrode and another half overlapping another respective electrode; and

means connected to said connections and operable in a first phase to energize two of said segment connections and one of said electrode connections to indicate the hour by activating two of said halves, and in a second phase to energize a single one of said segment connections and a single one of said electrode connections to indicate the minute by activating one of said halves.

4,242,748

ELECTRIC ALARM CLOCK

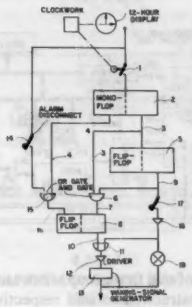
Erich Scheer, St. Georgen,, Fed. Rep. of Germany, assignor to Kundo - Kieninger & Obergfell, St. Georgen, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 888,962

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713221

Int. Cl.³ G04B *23/00*

U.S. Cl. 368—244 **8 Claims**



1. A waking-signal control system for an electric alarm clock having a clockwork driving a 12-hour time display and having an alarm-signal contact settable over a 12-hour range, said system comprising in combination:

a waking-signal generator energizable to produce a waking signal;

a first circuit connected to and responsive to said contact for producing a signal at a time determined by the setting of said contact in each of two 12-hour cycles within a 24-hour period representing a day;

a timing multivibrator connected to said first circuit and responsive to the signal produced thereby for triggering between alternate states to output an operating signal in one of said states;

a second circuit connected to said multivibrator and responsive to said operating signal and connected to said signal generator for energizing same in response to only one of the signals triggered in said first circuit by said contact in each of the 12-hour cycles of the day; and

a manually actuatable switching device connected to the output of said multivibrator and a signal device connected in circuit with said switching device for indicating the 12-hour cycle over which said signal generator is to respond to said contact.

4,242,749

OPERATING SYSTEM FOR A DATA TRANSMISSION SYSTEM

Fumihiko Takezoe, Hachioji, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Dec. 8, 1978, Ser. No. 967,634

Claims priority, application Japan, Dec. 30, 1977, 52-158454; Dec. 30, 1977, 52-158455

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—85 **8 Claims**

1. A system for selectively controlling the transmission of data selectively between plural central processing units and plural terminal units, said system comprising

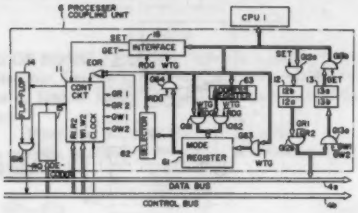
at least two ports selectively connected to said processing and terminal units, each said port being directly connected to at least one of said processing and terminal units,

at least one common bus comprising a data highway for interconnecting said ports, and at least one other common bus within each said port for connection within said port

with the respective processing and terminal unit(s) connected to each said port,

mode set means in plural selected ports for receiving, storing and outputting mode set information representing the mode of operation in which each of a first selected group of said terminal units is to be operated,

means in at least one of said processing units for supplying said mode set information to said mode set means, and for supplying mode assignment information corresponding to said mode set information for a respective one of said



terminal units of said first group when said processing unit provides an instruction to said respective terminal unit, said instruction involving a data transfer involving said terminal unit,

collating means in a selected plurality of said ports for selectively comparing said mode set information with said mode assignment information for said respective terminal unit corresponding to said instruction for allowing the transmission of data corresponding to said instruction only if said mode set and mode assignment information of said respective terminal unit coincide.

4,242,750

PROCESS FOR TESTING A DATA TRANSMISSION SYSTEM EMPLOYING A TEST LOOP

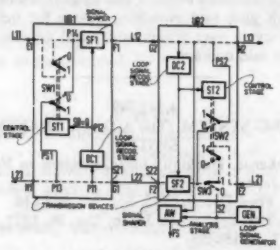
Herbert Finck, Wolfratshausen, and Konrad Reisinger, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,653

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746337

Int. Cl.³ H04L *17/00*

U.S. Cl. 371—22 **8 Claims**



1. In a process for testing a data transmission system by which data are transmitted via two transmission links and via first and second transmission devices, and in which a test loop is closed in response to a loop signal and a transmission section is tested, the improvement comprising the steps of:

transmitting a multi-bit loop signal from the second transmission device to the first transmission device; inverting at least one bit of the multi-bit loop signal at the first transmission device to form a modified loop signal; and transmitting the modified loop signal to the second transmission device.

4,242,751

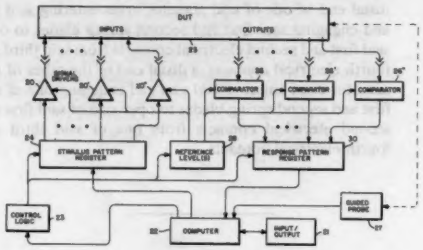
AUTOMATIC FAULT-PROBING METHOD AND APPARATUS FOR CHECKING ELECTRICAL CIRCUITS AND THE LIKE

Lutz P. Henckels, Park Ridge; Rene M. Haas, Bloomingdale, both of N.J., and Alan Levin, III, Acton, Mass., assignors to GenRad, Inc., Concord, Mass.

Continuation of Ser. No. 660,824, Feb. 24, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,430

Int. Cl.³ G01R *31/28*

U.S. Cl. 371—26 **12 Claims**



1. A method for using an interactive computer system for testing circuit units with the aid of a guided probe comprising connecting a circuit unit under test into the system; subjecting the circuit unit under test to a set of tests; upon detecting a failure, predicting the most likely internal failing nodes of the circuit unit; indicating to an operator successive predicted internal failing nodes to be probed, in order to expedite failure diagnosis; probing the predicted internal failing nodes; and in the event none of the predicted internal failing nodes turns out to be a failing node, indicating successive nodes to be probed by back-tracking from an external output node of the circuit under test.

4,242,752

CIRCUIT ARRANGEMENT FOR CODING OR DECODING OF BINARY DATA

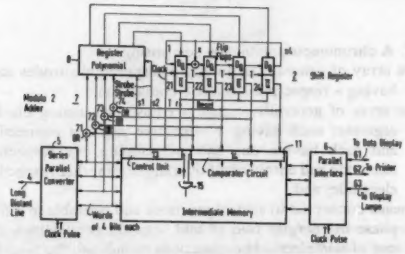
Hans Herkert, Hohenschaeftlarn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,010

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759106

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—37 **5 Claims**



1. Apparatus for receiving and checking incoming digital data comprising, a series parallel converter receiving on a long distant line incoming serial information and converting it to a

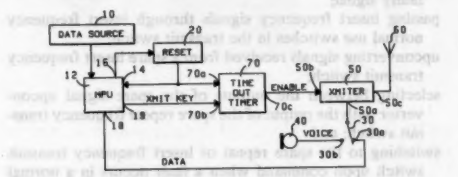
plurality of equal bit length words which are supplied in parallel to a plurality of word lines, an intermediate memory connected to said plurality of word lines, a modulo-2 adder which receives first inputs from said plurality of word lines, a polynomial register which receives a plurality of outputs from said modulo-2 adder and dividing such inputs by a generator polynomial, a partial decoder receiving a plurality of outputs from said register and supplying a plurality of outputs to said intermediate memory and to second inputs of said modulo-2 adder, a comparator means in said intermediate memory receiving outputs from said partial decoder and detecting whether the information content in said incoming digital data is valid, and output means connected to said intermediate memory and receiving the output data if said incoming data is valid.

4,242,753

RADIO TRANSMITTER TIME OUT TIMER

Arman V. Dolikian, Palatine, and Thomas A. Freeburg, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 1, 1978, Ser. No. 882,519
Int. Cl.³ H04B 1/04; H04L 27/04
U.S. Cl. 375—70 **3 Claims**



1. A disable control circuit for a radio transmitter, said transmitter being both actuated and disabled by suitable actuation and disable control signals, comprising

input means, for input of transmitter actuation control signals;

detection means for detecting the average duty cycle, over a period of time, of repeating transmitter actuation control signals, and for producing a disable signal in response to said average duty cycle exceeding a predetermined limit;

disable means, coupled to the detection means and the transmitter, for disabling the transmitter in response to said disable signal.

4,242,754

CLOCK RECOVERY SYSTEM FOR DATA RECEIVER

Bernard M. H. DePouilly, Paris, and Edouard M. J. A. I. Issenmann, Versailles, both of France, assignors to Le Material Telephonique, Boulogne-Billacourt, France

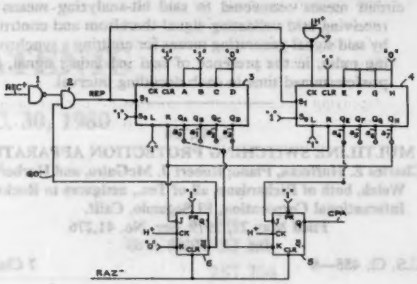
Filed Nov. 24, 1978, Ser. No. 963,326
Claims priority, application France, Nov. 30, 1977, 77 36062
Int. Cl.³ H04L 7/02
U.S. Cl. 375—110 **3 Claims**

1. A clock recovery system for a data receiver fed over a data transmission link with data in the form of binary pulse trains transmitted at a fixed clock frequency, said system comprising:

a ring counter triggering circuit which has the first of its two inputs connected to the data transmission link thereby to receive the binary pulse trains transmitted over said data transmission link;

a ring counter which has an input connected to the output of the ring counter triggering circuit to receive said binary pulse trains and which has one selected output connected to the second input of the ring counter triggering circuit, this output being selected in function of the length of the longest pulse to be considered as interference;

a JK flip-flop which has its inputs J and K connected to two chosen outputs of the ring counter and the output of which produces the recovered clock signal, the outputs being chosen in function of the position of the rising edges



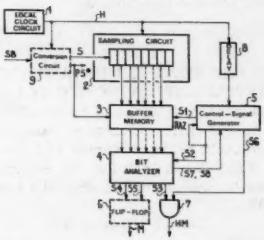
and the length of the pulses desired for the recovered clock.

4,242,755

CIRCUIT ARRANGEMENT FOR DECODING DIGITAL SIGNALS

Pierre Gauzan, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 869,236, Jan. 13, 1978, abandoned. This application Sep. 18, 1979, Ser. No. 76,562
Claims priority, application France, Jan. 14, 1977, 77 01067
Int. Cl.³ H04L 7/00
U.S. Cl. 375—114 **12 Claims**



1. A demodulator for binary message signals with bits distinguished by a characteristic phasing of two voltage levels, comprising:

local timing means for establishing a train of clock pulses with a cycle T1;

signal-generating means controlled by said clock pulses to establish a decoding interval T normally equaling n clock cycles T1 where n is an integer equal to at least 3;

sampling means connected to receive incoming message signals with bits whose length T' approximately equals said decoding interval T and to derive a plurality of samples from each of said bits;

bit-analyzing means connected to said sampling means for receiving therefrom at least some of the samples of an incoming message bit during each decoding interval in response to a transfer command from said signal-generating means, said bit-analyzing means being programmed to distinguish between predetermined acceptable configurations of bit samples and nonacceptable configurations differing therefrom and to discriminate among centered and off-centered acceptable configurations, with emission of a validating signal in the presence of any acceptable configuration and of a recalibration command in the presence of an off-centered configuration, said signal-generating means being responsive to said recalibrating command

for altering the next decoding interval by one clock cycle T1 to re-establish a normal time position between said decoding interval and the following message bits; and

circuit means connected to said bit-analyzing means for receiving said validating signal therefrom and controlled by said signal-generating means for emitting a synchronizing pulse, in the presence of said validating signal, at a predetermined time in each decoding interval.

4,242,756

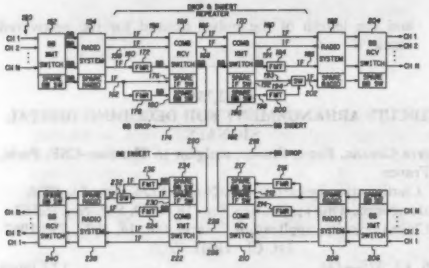
MULTILINE SWITCHING PROTECTION APPARATUS

Charles E. Huffman, Plano; Robert J. McGuire, and Herbert E. Welch, both of Richardson, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 21, 1979, Ser. No. 41,276

Int. Cl.³ H04B *1/60*

U.S. Cl. 455—8 **7 Claims**



1. The method of improving reliability in a drop and insert repeater portion of a multiline switch system having a single spare transmission frequency channel comprising, the steps of:

passing all signals to be retransmitted through normal use repeat frequency receive and transmit switches without signal frequency conversion;

signal frequency downconverting signals to be dropped prior to the drop frequency receive switch;

passing all signals to be dropped, after signal downconversion, through normal use drop frequency signal receive switches;

signal frequency upconverting signals to be inserted subsequent to any insert frequency normal use insert transmit switches;

dividing the received spare channel into two signal paths comprising retransmit and downconverted drop frequency signals;

passing the spare retransmit and spare drop frequency signals through separate spare repeat frequency and drop frequency receive switches;

periodically checking signals received at the normal receive switches for quality and switching to the spare repeat or spare drop frequency receive switch upon detection of a faulty signal received at a given normal receive switch in accordance with the type switch previously receiving the faulty signal;

passing insert frequency signals through insert frequency normal use switches in the transmit switch;

upconverting signals received from a spare insert frequency transmit switch;

selecting between the outputs of the spare signal upconverter with the output of the spare repeat frequency transmit switch; and

switching to the spare repeat or insert frequency transmit switch upon command when a fault occurs in a normal transmit channel.

DESIGN PATENTS

GRANTED DEC. 30, 1980

ERRATA

For CLASS	See PATENT NO.
D26–106	257,704
D15–007	257,739
D21–004	257,745

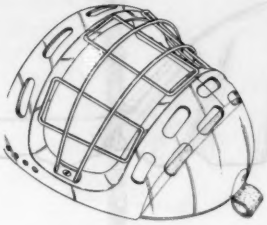
DESIGNS

DECEMBER 30, 1980

257,696
JACKET
Paula J. Sweet, 320 Sunset Ave., Venice, Calif. 90291
Filed Sep. 5, 1978, Ser. No. 939,906
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—187

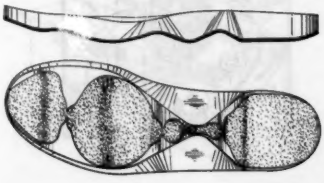
257,697
CHILD'S PLAY GARMENT
Donald A. Angrisano, 340 Hoyt St., and Anthony F. Mecca, 753 Seventh St., both of Buffalo, N.Y. 14213
Filed Dec. 12, 1977, Ser. No. 859,983
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—209

257,698
ICE HOCKEY MASK
Leif H. Skottheim, Malung, Sweden, assignor to Jofa Aktiebolag, Malung, Sweden
Filed Nov. 9, 1978, Ser. No. 958,993
Claims priority, application Sweden, May 10, 1978, 78-1248
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—231

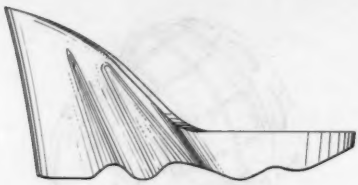


257,699
SHOE SOLE
Joseph P. Famolare, Jr., Putney, Vt., assignor to Famolare, Inc.
Filed Feb. 16, 1979, Ser. No. 12,654
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

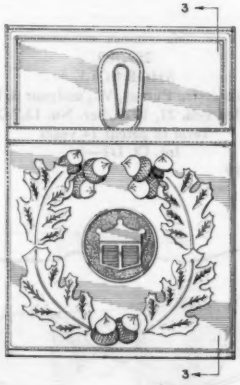
257,700
SHOE SOLE
Joseph P. Famolare, Jr., Putney, Vt., assignor to Famolare, Inc.
Filed Feb. 21, 1979, Ser. No. 13,732
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319



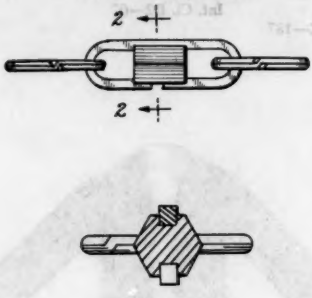
257,701
SHOE SOLE
Joseph P. Famolare, Jr., Putney, Vt., assignor to Famolare, Inc.
Filed Feb. 23, 1979, Ser. No. 14,345
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322



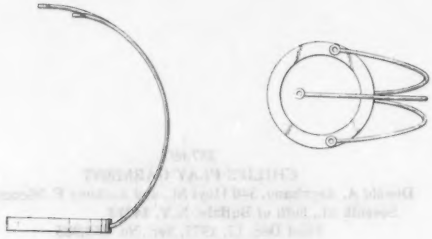
257,702
AUTO UTILITY POUCH
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., La Grange, Ga.
Filed Mar. 2, 1978, Ser. No. 882,964
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—40



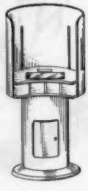
257,703
SLIDE KEY HOLDER
Youree Tyson, P.O. Box 491, Eunice, La. 70535
Filed Jun. 11, 1976, Ser. No. 695,561
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—61



257,704
STAND FOR LIGHT FIXTURE OR SIMILAR ARTICLE
Saad Z. M. Gabr, 81 Old Dover Rd., Canterbury, Kent, England
Filed Nov. 10, 1977, Ser. No. 850,308
Claims priority, application United Kingdom, Jun. 13, 1977, 980404; Jun. 13, 1977, 980405; Jun. 13, 1977, 980406; Jun. 13, 1977, 980407
Term of patent 14 years
Int. Cl. D26—*05*; D6—*06*
U.S. Cl. D26—106



257,705
TELEPHONE KIOSK
Sam Framer, Lauderhill, Fla., assignor to Colorcraft Corporation, Durham, N.C.
Filed Dec. 20, 1978, Ser. No. 971,382
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D6—25

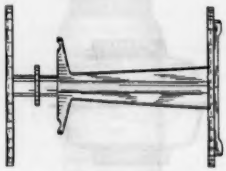


257,706

COMBINED TABLE AND MULTIPLE HOOK SUPPORT

Arno J. Liebman, 1819 Shore Dr., South, Apt. No. 218, South Pasadena, Fla. 33707

Filed Jul. 26, 1978, Ser. No. 928,842
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

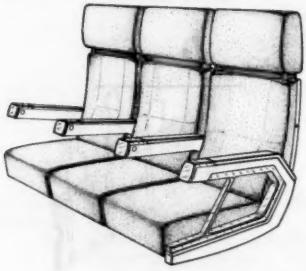


257,707

AIRCRAFT SEAT

Ralph G. Marrujo, Winston-Salem, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Mar. 17, 1978, Ser. No. 887,974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



257,708

ARM-CHAIR

Franco Cassina, Milan, Italy, assignor to Cassina S.p.A., Milan, Italy

Filed Mar. 22, 1978, Ser. No. 889,124
Claims priority, application Italy, Sep. 23, 1977, 22327 B/77
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

257,709

DISPLAY RACK

Lawrence A. Lewis, 285 Sunset Ave., Englewood, N.J. 07631

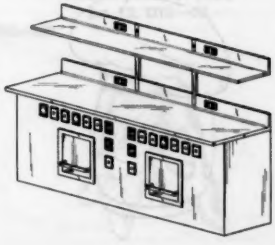
Filed Feb. 23, 1979, Ser. No. 14,628
Term of patent 14 years
Int. Cl. D20—*02*; D8—*08*
U.S. Cl. D6—114

257,710

COMBINED WORK TABLE AND SHELF UNIT PRIMARILY FOR USE BY A PEDIATRICIAN

Donald S. Basler, Minerva Park; Shirley P. Myer, and Wallop Tienprasid, both of Columbus, all of Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 18, 1978, Ser. No. 970,285
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

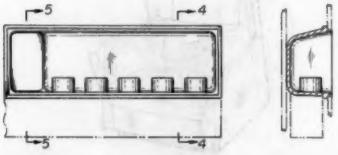


257,711
MIRROR ARRANGEMENT
William G. Willitts, 30 Rich St., Greenbrae, Calif. 94904
Filed Apr. 13, 1978, Ser. No. 895,915
Term of patent 7 years
Int. Cl. D6—*07*; D28—*03*
U.S. Cl. D6—234

257,712
KITCHEN APPLIANCE COVER
Joe Ann Levine, 9908 Catalina, Overland Park, Kans. 66207; Roberta L. Saper, 9321 Alhambra, Prairie Village, Kans. 66208, and Beverly R. Lewis, 1909 W. 68 St., Mission Hills, Kans. 66208
Filed Jul. 10, 1978, Ser. No. 923,040
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—269

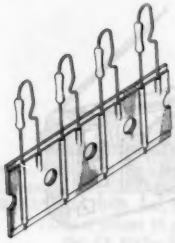
257,713
CASSEROLE FOR A MICROWAVE OVEN
Irving S. Korach, 17135 Gunther St., Granada Hills, Calif. 91344
Filed Feb. 13, 1978, Ser. No. 877,412
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—17

257,714
COMBINED HANDLE AND PUSH-BUTTON HOUSING FOR ELECTRICALLY ENCODED PUSH-BUTTON LOCK
Karl H. Heuser, Ruppichteroth-Winterscheid, Fed. Rep. of Germany, assignor to Huwil-Werke GmbH, Ruppichteroth, Fed. Rep. of Germany
Filed Jun. 1, 1978, Ser. No. 911,356
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 277
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331

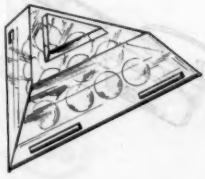


257,715
COMBINED JAR AND CLOSURE
Floyd E. Pettengill, Lancaster, Ohio, assignor to General Foods Corporation, White Plains, N.Y.
Filed Feb. 21, 1978, Ser. No. 879,659
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—387

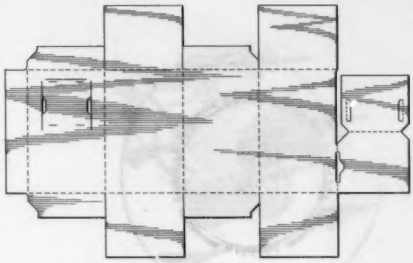
257,716
ELECTRONIC COMPONENT PACKAGE
Sho Masujima, Tokyo, Japan, assignor to TDK Electronics Company, Limited, Tokyo, Japan
Filed Sep. 13, 1977, Ser. No. 832,912
Claims priority, application Japan, Jul. 30, 1977, 52-30310
Term of patent 14 years
Int. Cl. D9—*05*; D13—*99*
U.S. Cl. D9—345



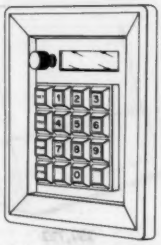
257,717
PACKAGING FOR BILLIARD BALLS
Terry M. Haber, 3197-B Airport Loop Dr., Costa Mesa, Calif. 92626
Filed Nov. 14, 1977, Ser. No. 851,473
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—431



257,718
METERED PACKAGE BLANK
Daniel P. Dutcher, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Jul. 17, 1978, Ser. No. 925,400
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

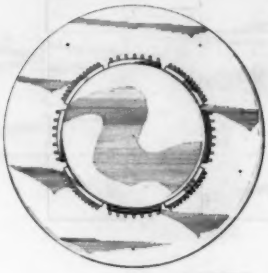


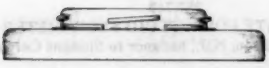
257,719
FACE PLATE FOR A FLUID FLOW METER
Junghans Irion, Edison, N.J., assignor to Siemens Corporation, Iselin, N.J.
Filed May 11, 1979, Ser. No. 37,656
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



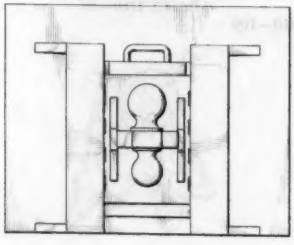
257,720
BARRICADE
Harold D. Rockman, 107 Second St., Fenton, Mich. 48430
Filed Apr. 3, 1978, Ser. No. 893,121
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

257,721
DOLLY PLATE FOR A REFUSE CONTAINER
Dale T. Maza, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Mar. 7, 1978, Ser. No. 884,379
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—31

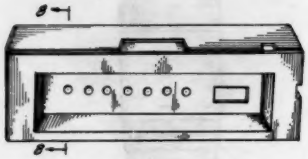




257,722
TRAILER HITCH
William A. Vanpool, 2300 Jewel La., Redding, Calif. 96001, assignor to William Arthur Vanpool, Redding, Calif.
Continuation-in-part of Ser. No. 952,611, Oct. 18, 1978, abandoned. This application Feb. 8, 1979, Ser. No. 10,251
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162

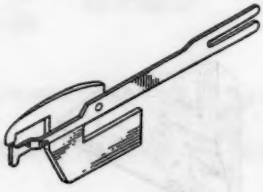


257,723
COVER PLATE FOR A CONTROL PANEL CIRCUIT BOARD
Roy Stockdale, Huntington, N.Y., assignor to Napco Security Systems, Inc., Copiague, N.Y.
Filed Aug. 4, 1978, Ser. No. 931,109
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—40



257,724
PORTABLE RADIO
Peter H. J. van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 14, 1977, Ser. No. 851,607
Claims priority, application United Kingdom, May 18, 1977, 980117/77
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

257,725
GATED HOOK FOR TUFTING MACHINES
Gary L. Ingram, Ooltewah, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.
Filed Sep. 5, 1978, Ser. No. 939,411
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—78



257,726

HEAD GEAR MOUNT FOR NIGHT VISION GOGGLES

Brian D. McCarthy, Oxted, England, assignor to MS Instruments Ltd.

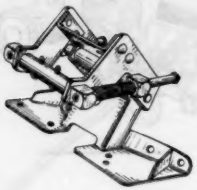
Filed Sep. 29, 1977, Ser. No. 837,760

Claims priority, application United Kingdom, Aug. 17, 1977, 981184/77

Term of patent 3½ years

Int. Cl. D16—*05*

U.S. Cl. D16—50



257,727

ELECTRIC GUITAR

Thomas E. Kimble, Covington, Ky., assignor to Baldwin Piano and Organ Company, Cincinnati, Ohio

Filed May 16, 1978, Ser. No. 906,157

Term of patent 14 years

Int. Cl. D17—*03*

U.S. Cl. D17—14

257,728

TYPEWRITER

Barry S. Herstein, Spring Valley, N.Y., and Robert Salmon, Secaucus, N.J., assignors to Buddy L Corporation, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,253

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—1

257,729

COMBINED DESK SET, DISPLAY CHAMBER AND NAMEPLATE

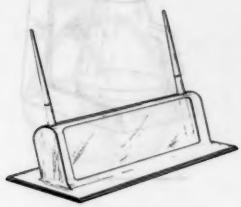
Wayne S. Brough, 5228 Brockwood Ave., Long Beach, Calif. 90808

Filed Aug. 30, 1978, Ser. No. 938,117

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—77



257,730

PROP FOR FLAT FILES

Cheston L. Eshelman, 621 NE. 30 Ter., Miami, Fla. 33137

Filed Nov. 23, 1977, Ser. No. 854,367

Term of patent 14 years

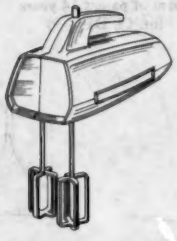
Int. Cl. D19—*99*

U.S. Cl. D19—86

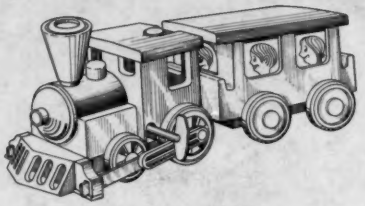
257,731
FLYING TOY
Naomi Zack, and Thomas W. Mahon, both of 1722 N. Serrano Ave., Hollywood, Calif. 90027
Filed Dec. 7, 1978, Ser. No. 967,210
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—88

257,732
TOY COFFEE MAKER
Ronald R. Klawitter, Gasconade County, Mo., assignor to Steven Manufacturing Company
Filed Apr. 17, 1978, Ser. No. 896,778
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122

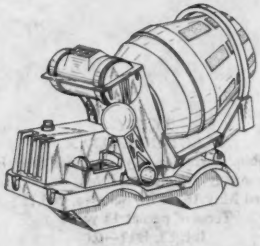
257,733
TOY MIXER
Ronald R. Klawitter, Gasconade County, Mo., assignor to Steven Manufacturing Company
Filed Apr. 17, 1978, Ser. No. 896,785
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122



257,734
TOY TRAIN
Herbert Rosenberg, Hong Kong, Hong Kong, assignor to Arco Industries Ltd., Hong Kong, Hong Kong
Filed Sep. 7, 1977, Ser. No. 831,357
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—129



257,735
TOY CEMENT MIXER TRUCK BODY
Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,849
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—138



257,736
GOLF CLUB HEAD
Herbert W. Lyon, Escondido, Calif.; Edmond S. Abrain, Warren, R.I.; John W. Jepson, Marion, Mass.; Charles D. Rambo, and Arthur F. Santy, both of Escondido, Calif., assignors to Acushnet Company
Filed Feb. 1, 1979, Ser. No. 8,530
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220

257,737

PROJECTOR FOR ELONGATED PROJECTILES

Fred Brunty, 140 Village Green, Princeton, W. Va. 24740, and William J. Hall, 723 Windy La., Rocky Mount, Va. 24151

Filed Jan. 6, 1978, Ser. No. 867,525
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—3

257,738

HOLDER FOR WATER SOLUBLE MATERIAL

Rainer Manthei, Weichering, Fed. Rep. of Germany, assignor to Globol-Werk GmbH, Neuburg, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,835
Claims priority, application Fed. Rep. of Germany, May 22, 1978, 350
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

257,739

GREASE PUMP

Graham J. Luker, Penshurst, Australia, assignor to Macnaught Pty. Limited, Turrella, Australia

Filed Jan. 18, 1978, Ser. No. 870,581
Claims priority, application Australia, Jul. 21, 1977, 72347
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7

257,740

SPRAYER NOZZLE

Theodore J. Humphrey, II, Miami Lakes, and Walter H. Wesner, Plantation, both of Fla., assignors to The AFA Corporation, Miami Lakes, Fla.

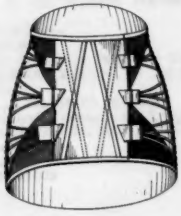
Filed Apr. 13, 1978, Ser. No. 895,902
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

257,741

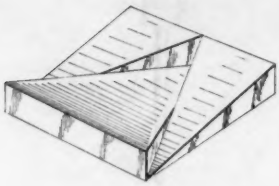
LOWER BACK SUPPORT

Marguerite R. Williams, Trumbull, Conn., assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Jun. 27, 1977, Ser. No. 810,048
Term of patent 14 years
Int. Cl. D24—*03*; D2—*01*
U.S. Cl. D24—64



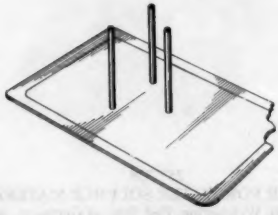
257,742
DECORATOR MODULE
Willfried Gerlach, 2050 Bridletowne Cr., Toronto, Ontario, Canada
Filed Jan. 20, 1978, Ser. No. 871,027
Claims priority, application Canada, Aug. 18, 1977, 18-08-77-1; Aug. 18, 1977, 18-08-77-2
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



257,743
ARC LAMP
John A. Tedesco, San Francisco, Calif., assignor to The Phoebus Company, Inc.
Filed Jul. 24, 1978, Ser. No. 927,024
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—104

257,744
SHAVING CUTTER
Dirk J. van Hemmen, and Jochem J. De Vries, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 639,861, Dec. 11, 1975, abandoned.
This application Jan. 16, 1978, Ser. No. 869,937
Claims priority, application Benelux, Jun. 13, 1975, 50354-00
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—47

257,745
RING TOSS GAME TARGET
Adolph Abraham, 1357 Barry Ave., Chicago, Ill. 60657
Filed Jun. 22, 1978, Ser. No. 918,170
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—4



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF DECEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Ricciardi, Mario J., 4,241,658, Cl. 101-217.000.

A. H. Robins Company, Inc.: *See—*
Cale, Albert D., Jr., 4,242,261, Cl. 260-239.00A.

A.S. Daly Nominees Pty. Ltd.: *See—*
Daly, Andrew S.; May, Peter R.; and Braines, George E., 4,241,845, Cl. 220-203.000.

A/S De Smithske: *See—*
Carlsson, Knut G., 4,242,202, Cl. 210-242.300.

A/S Hoyer-Ellefsen: *See—*
Gjerde, Trygve; and Seim, Ronald, 4,242,010, Cl. 405-157.000.

A/S N. Foss Electric: *See—*
Zakora, Miloslav, 4,242,058, Cl. 414-437.000.

A-T-O Inc.: *See—*
Carter, Sidney T., 4,242,168, Cl. 156-357.000.

Aalbers, Johan G.: *See—*
Smid, Jacob K.; and Aalbers, Johan G., 4,242,215, Cl. 252-100.000.

AB Asea-Atom: *See—*
Hellman, Erik R., 4,241,903, Cl. 266-109.000.

AB Kabi: *See—*
Claeson, Karl G.; Simonsson, Leif R.; and Arielly, Salo, 4,242,329, Cl. 424-177.000.

AB Volvo Penta: *See—*
Pichl, Heinz; and Kossek, Gunther, 4,241,620, Cl. 74-573.00R.

AB Wicanders Korkfabriker: *See—*
Nemeth, Jozsef, 4,242,390, Cl. 428-47.000.

Abbott Laboratories: *See—*
Lartey, Paul A.; and Grampovnik, David J., 4,242,503, Cl. 536-17.00R.

Abdalla, Mohamed I.; and Thomas, Jacques A. Method of manufacturing thin film electroluminescent devices. 4,242,370, Cl. 427-66.000.

Abex Corporation: *See—*
Shaw, Edwin L., 4,242,068, Cl. 418-269.000.

Abolins, Visvaldis, to General Electric Company. Glass reinforcements and fire retardant glass-resin composites therefrom. 4,242,254, Cl. 260-40.00R.

Abramova, Zinaida A.: *See—*
Zitser, Vitaly A.; Melnikov, Alexandr V.; Bachelis, Leonid V.; Morozov, Jury E.; Ivanov, Vladimir A.; and Abramova, Zinaida A., 4,241,779, Cl. 164-207.000.

Ackeret, Peter, to Licinvest AG. Picture viewer. 4,241,528, Cl. 40-513.000.

Ackroyd, Rand H., to Watts Regulator Company. Backflow preventer. 4,241,752, Cl. 137-107.000.

Acme Visible Records, Inc.: *See—*
Grubb, Frederick H., Jr., 4,241,964, Cl. 312-305.000.

Action Instruments Company, Inc.: *See—*
Mate, David J., 4,242,665, Cl. 340-870.380.

Adamovske Strojirny, Narodni Podnik: *See—*
Cerny, Arnost; and Janecek, Jaroslav, 4,241,619, Cl. 74-440.000.

Adams, Roderick D. Apparatus and method for removing core mark material from molded concrete blocks. 4,242,299, Cl. 264-504.000.

Adams, William J.: *See—*
Wernet, William F.; Adams, William J.; and Haskins, Steve W., 4,242,543, Cl. 200-1.00A.

Adler, Robert, to Extel Corporation. Dot matrix printhead driver. 4,242,004, Cl. 400-124.000.

AGA Aktiebolag: *See—*
Berndtsson, Christer, 4,241,732, Cl. 128-204.240.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Pouey, Michel, 4,241,999, Cl. 356-331.000.

AGFA-Gevaert, A.G.: *See—*
Luhrig, Hermann; Kovacic, Guido; and Muller, Horst-Peter, 4,242,443, Cl. 430-496.000.
Puschel, Walter; Vetter, Hans; and Marx, Paul, 4,242,435, Cl. 430-242.000.

AGFA-GEVAERT N.V.: *See—*
Mertens, Ludovicus M.; and Vermeulen, Leon L., 4,242,436, Cl. 430-248.000.

Agrow Plow Pty. Limited: *See—*
Ryan, John W., 4,241,615, Cl. 74-61.000.

Aiba, Takaaki; Takahashi, Ryoichi; Hosoi, Takuji; and Konno, Tutomu, to Kureha Kagaku Kogyo Kabushiki Kaisha; Sumikin Coke Co., Ltd; and Sumitomo Metal Industries, Ltd. Mass production system of highly aromatic petroleum pitch. 4,242,196, Cl. 208-40.000.

Aidlin Automation, Inc.: *See—*
Aidlin, Stephen H.; and Tartakowsky, Michael, 4,242,033, Cl. 414-662.000.

Aidlin, Stephen H.; and Tartakowsky, Michael, to Aidlin Automation, Inc. Machine and method for vertical transportation of containers. 4,242,033, Cl. 414-662.000.

Air Products and Chemicals, Inc.: *See—*
Nicholas, David M.; and Hegarty, William P., 4,242,108, Cl. 55-40.000.

Airco, Inc.: *See—*
Young, Morris S., 4,242,536, Cl. 174-128.00S.

Aishima, Itsuho; Seki, Junji; Matsumoto, Koichi; Furusawa, Yonemasa; Tsukisaka, Ryogo; and Takahashi, Yuhachi, to Asahi Kasei Kogyo Kabushiki Kaisha; and Shiraishi Central Laboratories Co., Ltd. Composition comprising a thermoplastic resin and mineral filler particles coated with an ethylenically unsaturated organic acid, the ethylenic double bonds of which remain substantially unreacted; product resulting from causing said to react. 4,242,251, Cl. 260-37.00N.

Aisin Seiki Kabushiki Kaisha: *See—*
Ban, Hiroshi; Kobayashi, Tadamasa; and Kuno, Syozo, 4,241,820, Cl. 192-89.00B.
Mori, Keizi, 4,241,948, Cl. 296-216.000.
Okuyama, Teiji, 4,241,894, Cl. 248-576.000.
Satomoto, Atsushi, 4,241,873, Cl. 236-87.000.

Akiyama, Nobuyuki: *See—*
Kuni, Asahiro; Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,242,702, Cl. 358-106.000.

Akron Catheter, Inc.: *See—*
Allen, Dwight L., 4,242,287, Cl. 260-746.000.

A.G. fur Industrielle Elektronik AGIE: *See—*
Ullmann, Werner; Schumacher, Bernd; Ruh, Herbert; and Kilcher, Beat, 4,242,556, Cl. 219-69.00W.

Akzona Incorporated: *See—*
Allen, Thomas C., 4,242,242, Cl. 260-17.4CL.
Battey, Paul K.; Bergfeld, Manfred; and Hope, Peter, 4,242,523, Cl. 560-48.000.
Brandeau, Edward P., 4,241,498, Cl. 29-861.000.
Yntema, Klaas; and Klos, Cornelis D. W., 4,242,255, Cl. 260-45.75P.

Alberghini, Alfred C., to Sewell Plastics, Inc. Base-cup for assuring vertical alignment of semi-hemispherically bottomed bottles. 4,241,839, Cl. 215-100.00R.

Albrecht, Hans P.; von Philipsborn, Gerda; Siebeneick, Hans U.; and Raschack, Manfred, to BASF Aktiengesellschaft. 4,5-Methanobufadienolide-rhamnosides, their preparation, and drugs containing these compounds. 4,242,332, Cl. 424-182.000.

Albright, Jay D.: *See—*
Trust, Ronald I.; and Albright, Jay D., 4,242,515, Cl. 546-119.000.

Alexy, Fred H., to AMG Industries, Inc. Thermal insulation end panel assembly for a paper machine dryer cylinder and stud clamp therefor. 4,241,518, Cl. 34-110.000.

Ali Khan, Eskendar: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,242,345, Cl. 424-253.000.

Allcock, Harry R.; Kosydar, Karen M.; and Wright, Sarah D., to Firestone Tire & Rubber Company, The. Colored polymers comprising poly(organophosphazenes) with chromophores as substituent groups. 4,242,499, Cl. 528-399.000.

Allen, Dwight L., to Akron Catheter, Inc. Silicone-containing elastomer and process for the preparation thereof. 4,242,287, Cl. 260-746.000.

Allen, John W., Jr., to Creaghan, James P., a part interest. Impact tool for dislodging stuck drill bits. 4,241,797, Cl. 175-237.000.

Allen, Thomas C., to Akzona Incorporated. Highly absorbent fibers of rayon with sulfonic acid polymer incorporated. 4,242,242, Cl. 260-17.4CL.

Allerino, Giuseppe: *See—*
Franchi, Aldo; and Allerino, Giuseppe, 4,242,540, Cl. 179-6.00R.

Allied Chemical Corporation: *See—*
Vander Mey, John E., 4,242,218, Cl. 252-143.000.
Yee, Kwok C.; Preziosi, Anthony F.; Patel, Gordhanbhai N.; Chance, Ronald R.; Miller, Granville G.; and Baughman, Ray H., 4,242,440, Cl. 430-346.000.

Allis-Chalmers Canada, Limited: *See—*
Vaughan, Warren R.; and Suykens, Matthieu, 4,242,026, Cl. 414-145.000.

Allis-Chalmers Corporation: *See—*
Harrer, Paul H., 4,241,849, Cl. 221-266.000.

Allison, George M., III, to Phillips Petroleum Company. Rubbery polymer sealant compositions. 4,242,245, Cl. 260-27.0BB.

Allstar Fasteners, Inc.: *See—*
Burchell, Stanley C., 4,241,468, Cl. 10-169.000.

Alonso, Oscar, to International Telephone and Telegraph Corporation. Electrical push-button switch. 4,242,546, Cl. 200-16.00A.

Alpermann, Hans G.: *See—*
Stache, Ulrich; Fritsch, Werner; and Alpermann, Hans G., 4,242,334, Cl. 424-243.000.

Alther, George R., to International Minerals & Chemical Corp. Activation of clays by compaction. 4,242,140, Cl. 106-72.000.

Aluminium Suisse S.A.: *See—*
Dolveck, Gilbert, 4,241,844, Cl. 220-67.000.

Aluminum Company of America: *See—*
Willis, Wilburn C., 4,241,840, Cl. 215-220.000.

ALZA Corporation: *See—*
Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., 4,241,733, Cl. 128-275.000.

AM International, Inc.: *See—*
Jackson, Richard W.; and Seelenbinder, Terry G., 4,241,989, Cl. 354-299.000.

Amada Company, Limited: *See—*
Moriya, Kikuo, 4,241,630, Cl. 83-409.000.

Ambler, E. Curtis, to Stanley Works, The. Mitre box. 4,241,634, Cl. 83-763.000.

Amchem Products, Inc.: *See—*
Hall, Wilbur S.; and Leister, Harry M., 4,242,379, Cl. 427-327.000.

American Cyanamid Company: *See—*
Cano, Francis J.; Kuo, Joseph S. C.; and Querry, Merle V., 4,242,501, Cl. 536-1.000.
Pellon, Joseph J.; and Savoy, Paul D., 4,242,247, Cl. 260-29.6WQ.
Shepherd, Robert G., 4,242,273, Cl. 260-453.0RW.
Trust, Ronald I.; and Albright, Jay D., 4,242,515, Cl. 546-119.000.

American District Telegraph Company: *See—*
Cooper, Glenn F., 4,242,673, Cl. 340-630.000.

American Hardware & Paint Co., Inc.: *See—*
Josephson, Louis, 4,241,539, Cl. 49-91.000.

American Safety Razor Company: *See—*
Iten, Clemens A., 4,241,500, Cl. 30-40.000.

American Science and Engineering, Inc.: *See—*
Annis, Martin; and Frederick, Edwin, 4,242,583, Cl. 250-358.00R.
Silk, John K.; Krieger, Allen S.; and Huang, Eugene W. C., 4,242,588, Cl. 250-492.00A.

AMG Industries, Inc.: *See—*
Alexy, Fred H., 4,241,518, Cl. 34-110.000.

Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, to Sodip SA. Hollow fibre apparatus. 4,242,203, Cl. 210-321.100.

AMP Incorporated: *See—*
Defibaugh, George R.; Shannon, Suel G.; and Swengel, Robert C., Jr., 4,242,535, Cl. 174-88.00R.
Rider, Clarence N., Jr.; and Rudy, William J., Jr., 4,241,970, Cl. 339-99.00R.

Amtrol Inc.: *See—*
Walker, Robert; and Lane, Joseph A., 4,241,843, Cl. 220-5.00A.

Anaconda Company, The: *See—*
Robertson, Joseph D., 4,241,770, Cl. 141-198.000.

Anderson, Gordon H.; and Johnson, Steven R., to King-Seeley Thermos Co. Separating and unloading device for vibratory finishing machines. 4,241,545, Cl. 51-163.200.

Anderson, Lloyd E.: *See—*
Bell, Dwain C.; and Anderson, Lloyd E., 4,241,930, Cl. 280-47.290.

Anderson, Weston A., to Varian Associates, Inc. Ultrasonic imaging system utilizing dynamic and pseudo-dynamic focusing. 4,241,610, Cl. 73-626.000.

Ando, Otaro, to Olympus Optical Co., Ltd. Composite type acoustic transducer. 4,242,541, Cl. 179-110.00A.

Andreoni, Alessandro: *See—*
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,242,508, Cl. 542-430.000.

Andrew, Malcolm S.; and Backhouse, Alan J., to Imperial Chemical Industries Limited. Spray coating of acrylic resin comprising polymeric microparticles. 4,242,384, Cl. 427-421.000.

Andrew S. McCreath & Son, Inc.: *See—*
Pennington, Fred A., Sr.; Pennington, Fred A., Jr.; and Porr, John W., Jr., 4,241,601, Cl. 73-17.00R.

Andrews Paper & Chemical Co., Inc.: *See—*
Muller, Peter, 4,241,690, Cl. 118-63.000.

Andrulitis, William B.; Miles, Steven G.; and Kurth, William T. Method of fabricating solar cell modules. 4,241,493, Cl. 29-572.000.

Anheuser-Busch, Incorporated: *See—*
Ehrenthal Irving; Shieh, Kenneth K.; Scallet, Barrett L.; and Rajpara, Jagdish, 4,242,451, Cl. 435-94.000.

Annis, Martin; and Frederick, Edwin, to American Science and Engineering, Inc. X-ray imaging variable resolution. 4,242,583, Cl. 250-358.00R.

Antal, Sandor; Bartha, Zoltan; Gorgenyi, Peter; Meitzen, Nandor; and Arvai, Mihaly, to Taurus Gumiipari Vallalat. Rubber hose with spiral fiber reinforcing core. 4,241,763, Cl. 138-127.000.

Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., to Du Pont de Nemours, E. I., and Company. High solids ambient temperature curing coatings of acrylic-fatty acid drying oil resins. 4,242,243, Cl. 260-23.0AR.

Aoshiro, Hisatake, to Machida Endoscope Co., Ltd. Endoscope with gas-tight cap permitting pressurization. 4,241,729, Cl. 128-4.000.

Aoyagi, Takaaki: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,242,453, Cl. 435-123.000.

Apfelbaum, Jerome G.: *See—*
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., 4,241,650, Cl. 99-372.000.

Appleton Papers Inc.: *See—*
Hoover, Troy E.; Farber, Sheldon; and Becker, William J., 4,242,513, Cl. 544-345.000.

Arai, Yoshiaki, to Reiko Co., Ltd. Method of making a decorated film with a metal layer in the form of a given pattern. 4,242,378, Cl. 427-264.000.

Araya, Takeshi: *See—*
Fujiwara, Osamu; Araya, Takeshi; and Udagawa, Tsugio, 4,242,620, Cl. 318-576.000.

Arcara, Frank J. Olympic event board game. 4,241,924, Cl. 273-277.000.

Arco Industries Ltd.: *See—*
Tsui, Kwok W., 4,241,716, Cl. 124-27.000.

Arends, Andrew; Arends, Gary W.; and Spector, George. Compressed air dryer. 4,242,111, Cl. 55-269.000.

Arends, Gary W.: *See—*
Arends, Andrew; Arends, Gary W.; and Spector, George, 4,242,111, Cl. 55-269.000.

Arendt, Ronald H., to General Electric Company. Process for electrolyte structure with strontium titanate matrix for molten carbonate fuel cells. 4,242,426, Cl. 429-193.000.

Arielly, Salo: *See—*
Claeson, Karl G.; Simonsson, Leif R.; and Arielly, Salo, 4,242,329, Cl. 424-177.000.

Armco Inc.: *See—*
Brennan, John R., 4,241,788, Cl. 166-105.500.

Armistead, Hubert P. Storage rack for record albums. 4,241,955, Cl. 312-12.000.

Armour and Company: *See—*
Colescott, Robert L.; Kaiser, Emil; and Bossinger, Charles D., 4,242,238, Cl. 260-8.000.

Armstrong Cork Company: *See—*
Leib, Ronald J.; and Sparks, Moses, Jr., 4,242,394, Cl. 428-95.000.

Armstrong, George H.: *See—*
Van Cleve, Russell; Armstrong, George H.; and Simroth, Donald W., 4,242,249, Cl. 260-33.20R.

Arndt, Otto; and Mees, Bernhard, to Hoechst Aktiengesellschaft. Process for the preparation of isomer-free toluene-4-sulfonic acid. 4,242,275, Cl. 260-505.00E.

Arvai, Mihaly: *See—*
Antal, Sandor; Bartha, Zoltan; Gorgenyi, Peter; Meitzen, Nandor; and Arvai, Mihaly, 4,241,763, Cl. 138-127.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Aishima, Itsuho; Seki, Junji; Matsumoto, Koichi; Furusawa, Yonemasa; Tsukisaka, Ryogo; and Takahashi, Yuhachi, 4,242,251, Cl. 260-37.00N.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Okudaira, Sadao, 4,241,981, Cl. 350-184.000.

Asai, Akiji: *See—*
Thies, Peter W.; Asai, Akiji; and David, Samuell, 4,242,341, Cl. 424-248.550.

Asakawa, Tatsushi: *See—*
Morozumi, Shinji; Yamazaki, Yoshio; Asakawa, Tatsushi; and Nakazaki, Yasunori, 4,242,679, Cl. 340-765.000.

Asakura, Masahiro: *See—*
Kitamura, Kenzo; Ebitani, Hideaki; and Asakura, Masahiro, 4,242,302, Cl. 422-94.000.

Asao, Kosakai: *See—*
Chikanobu, Kimijima; Asao, Kosakai; Tutomu, Shioya; and Tomotaka, Tatsumi, 4,241,512, Cl. 33-438.000.

Aschberger, Matthias; and Link, Dieter, to Bosch-Siemens Hausgerate GmbH. Magnetic valve, especially three-way valve as a switching device for multi-temperature cooling apparatus with only one refrigeration machine. 4,242,116, Cl. 62-199.000.

ASEA Aktiebolag: *See—*
Marcusson, Lage; and Polheimer, Lars, 4,241,666, Cl. 105-59.000.

Ateliers des Charmilles S.A.: *See—*
Delpretti, Roger, 4,242,555, Cl. 219-69.00M.

Atsumi, Haruo, to Omron Tateisi Electronics Co. Limit switch. 4,242,548, Cl. 200-47.000.

Attaway, Julian J.: *See—*
Hall, James H., III; and Attaway, Julian J., 4,241,549, Cl. 52-60.000.

Aubril, Pierre: *See—*
Diguet, Daniel; David, Gerard A.; and Aubril, Pierre, 4,242,696, Cl. 357-30.000.

Audette, DeVere J., deceased: *See—*
Middleton, Donald E.; and Audette, DeVere J., deceased, 4,241,808, Cl. 182-155.000.

Audette, Marguerite, executrix: *See—*
Middleton, Donald E.; and Audette, DeVere J., deceased, 4,241,808, Cl. 182-155.000.

Augunas, Algis G., to General Motors Corporation. Winding prevention mechanism for seat belt retractor. 4,241,887, Cl. 242-107.700.

August, Peter; and Primas, Willi, to Wacker-Chemie GmbH. Process for preparing organopolysiloxane resins containing Si-bonded vinyl groups. 4,242,486, Cl. 528-14.000.

August Ruggeberg, Firma: *See—*
Strojny, Werner, 4,241,624, Cl. 76-83.000.

Aurora Products Canada Limited: *See—*
Vandenbrink, Anthonie, 4,241,875, Cl. 238-10.00F.

Austin, Michael J.: *See—*
Carruthers, John A.; and Austin, Michael J., 4,241,936, Cl. 280-507.000.

Autographic Business Forms, Inc.: *See—*
Dingman, Arthur E., 4,241,655, Cl. 101-79.000.

Automated Building Components, Inc.: *See—*
Castillo, Adolfo; Kushner, Ben; and Seipos, Andrew G., 4,241,651, Cl. 100-35.000.

Avtex Fibers Inc.: *See—*
Bockno, Gregory C., 4,242,405, Cl. 428-224.000.

Awano, Takeshi: *See*—
Maekawa, Naozane; and Awano, Takeshi, 4,241,886, Cl. 242-107.200.
Ayer, George E., to Bunker Ramo Corporation. Panel mount for electrical connector. 4,241,972, Cl. 339-126.00R.
Ayme, Gerard; and Szabo, Ladislas, to Institut Merieux. Process for separating lipids from endotoxins. 4,242,270, Cl. 260-412.800.
Azadian, Genevieve; Philibert, Daniel; and Pierdet, Andre, to Roussel Uclaf. Novel 17α-aryl-steroids. 4,242,335, Cl. 424-243.000.
Aziende Colori Nazionali Affini Acna S.p.A.: *See*—
Gasperini, Pietro; and Brunetti, Francesco, 4,242,093, Cl. 8-456.000.
B. A. Security Systems Limited: *See*—
Crick, David W., 4,242,669, Cl. 340-567.000.
B. F. Goodrich Company, The: *See*—
Garver, Richard F.; and Stevanovich, Srbo M., 4,242,070, Cl. 425-28.00B.
B & H Manufacturing Company, Inc.: *See*—
Hoffmann, Wolfgang, 4,242,167, Cl. 156-357.000.
Baack, Michael; Bartkowiak, Artur; and Neuroth, Juergen, to Revertex Limited. Use of monohydroxylated polybutadiene as a reactive plasticizer in polyurethanes. 4,242,468, Cl. 521-170.000.
Babcock, Bryce W.; Reynolds, Mark P.; and Saluja, Kulbir, to Federal-Mogul Corporation. Clutch pressure plate noise reduction. 4,241,819, Cl. 192-70.270.
Bachelis, Leonid V.: *See*—
Zitser, Vitaly A.; Melnikov, Alexandr V.; Bachelis, Leonid V.; Morozov, Jury E.; Ivanov, Vladimir A.; and Abramova, Zinaida A., 4,241,779, Cl. 164-207.000.
Bachman, Gilbert, to Dittler Brothers, Inc. Secure contest card. 4,241,942, Cl. 283-6.000.
Backhouse, Alan J.: *See*—
Andrew, Malcolm S.; and Backhouse, Alan J., 4,242,384, Cl. 427-421.000.
Badger Meter, Inc.: *See*—
Bradham, Allen C., III, 4,241,613, Cl. 73-861.710.
Baer, Martin A., to Illinois Tool Works Inc. Method and apparatus for producing drill screws. 4,241,639, Cl. 85-47.000.
Bahl, Surinder K., to Mead Corporation, The. Heated deflection electrode assembly for a jet drop recorder. 4,242,687, Cl. 346-75.000.
Baikoff, Eugene M. A. Comminuting machine. 4,241,882, Cl. 241-236.000.
Baldauf, Dale, to Paul Revere Corporation. Auxiliary drive system with neutral. 4,241,577, Cl. 60-420.000.
Ball Corporation: *See*—
McDowell, Jerry T., 4,241,629, Cl. 83-343.000.
Sanford, Gary G., 4,242,685, Cl. 343-770.000.
Ball, William J.; Palmer, Keith W.; and Stewart, David G., to British Petroleum Company Limited, The. Method for preparing aluminosilicates, their use as catalyst supports and catalysts, and method for producing catalysts therefrom. 4,242,233, Cl. 252-431.00N.
Bally Manufacturing Corporation: *See*—
Hooker, Donald E., 4,241,920, Cl. 273-143.00R.
Ban, Hiroshi; Kobayashi, Tadamasa; and Kuno, Syozo, to Aisin Seiki Kabushiki Kaisha. Clutch assembly. 4,241,820, Cl. 192-89.00B.
Baney, Ronald H.; and Harris, Len A., to Dow Corning Corporation. Organothiol-containing siloxane resins as adhesion promoters for siloxane resins. 4,242,416, Cl. 428-412.000.
Bardsley, Harold B., to Spencer Wright Industries, Inc. Modular gauge parts assembly for cut/loop tufting machines. 4,241,675, Cl. 112-79.00A.
Barmag Barmer Maschinenfabric AG: *See*—
Turk, Herbert; and Schiminski, Herbert, 4,241,574, Cl. 57-200.000.
Barmag Barmer Maschinenfabrik AG: *See*—
Turk, Herbert; and Schiminski, Herbert, 4,241,571, Cl. 57-58.890.
Barnes, Alan C.; and Kennewell, Peter D., to Roussel Uclaf. Process for preparing 5-alkyl-7-(S-alkyl-sulfonimidoyl)-xanthone-2-carboxylic acids. 4,242,267, Cl. 260-335.000.
Barnett, Eugene J., to White Consolidated Industries, Inc. Range body cooling system. 4,241,718, Cl. 126-21.00R.
Barnett, Harry. Box sealing device. 4,241,862, Cl. 227-155.000.
Barrera, Roberto G.: *See*—
Longenecker, John G., 4,241,648, Cl. 99-349.000.
Bartha, Zoltan: *See*—
Antal, Sandor; Bartha, Zoltan; Gorgenyi, Peter; Meitzen, Nandor; and Arvai, Mihaly, 4,241,763, Cl. 138-127.000.
Bartkowiak, Artur: *See*—
Baack, Michael; Bartkowiak, Artur; and Neuroth, Juergen, 4,242,468, Cl. 521-170.000.
Bartoli, Francesco; Morisi, Franco; and Zaccardelli, Delio, to Snamprogetti S.p.A. Radial reactor for enzyme-catalyzed reactions. 4,242,461, Cl. 435-288.000.
Bartolini, Alfred: *See*—
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Matucheski, Joseph V.; Yee, Clifford S. L.; Spellman, Michael T.; Hartley, Donald J.; and Barton, William D., 4,242,046, Cl. 416-132.00A.
Bartus, Stephen P., Jr.: *See*—
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BASF Aktiengesellschaft: *See*—
Albrecht, Hans P.; von Philipsborn, Gerda; Siebeneick, Hans U.; and Raschack, Manfred, 4,242,332, Cl. 424-182.000.
Diem, Hans; Dudeck, Christian; Lehmann, Gunter; Matthias, Guenther; and Petri, Norbert, 4,242,282, Cl. 568-471.000.
Dockner, Toni; Frank, Anton; Kempe, Uwe; Wetzler, Matthias; and Karn, Helmut, 4,242,517, Cl. 548-342.000.
Reinert, Friedrich, 4,242,210, Cl. 252-8.800.
Rossy, Phillip; and Hoffmann, Werner, 4,242,518, Cl. 549-61.000.
Schlecht, Helmut; Weberndoerfer, Volkmar; and Widder, Rudi, 4,242,187, Cl. 204-162.0SH.
Vogel, Hans-Henning; Oppenlaender, Knut; and Starke, Klaus, 4,242,101, Cl. 44-58.000.
Bate, Robert T., to Texas Instruments Incorporated. Non-volatile semiconductor memory elements. 4,242,737, Cl. 365-184.000.
Batjukov, Vladimir I.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Shkhian, Tsolak G.; and Sumatokhin, Vitold A. Drum for storage of nuclear reactor fuel assemblies. 4,242,178, Cl. 176-30.000.
Batliwalla, Neville S., to Raychem Corporation. Water immersible heater. 4,242,573, Cl. 219-528.000.
Battelle Development Corporation: *See*—
Hughes, Kenneth E.; and DeVore, Dale P., 4,242,291, Cl. 264-1.000.
Maringer, Robert E., 4,242,069, Cl. 425-8.000.
Battelle-Institut e.V.: *See*—
Klimmek, Albrecht; Krieger, Wolfram; and Reiner, Roland, 4,242,159, Cl. 156-155.000.
Battey, Paul K.; Bergfeld, Manfred; and Hope, Peter, to Akzona Incorporated. Process for the preparation of para-nitroso-diphenylhydroxylamines. 4,242,523, Cl. 560-48.000.
Bauer, Werner R., to Robertshaw Controls Company. Methods of making a reversing valve construction and a valve member therefor. 4,241,486, Cl. 29-157.10R.
Baughman, Ray H.: *See*—
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Bauman, Glenn R.: *See*—
Bodycomb, Frederick M., Jr.; and Bauman, Glenn R., 4,241,505, Cl. 30-390.000.
Baumgarten, Borje N. V., to Hiab-Foco AB. Gripping tool, particularly for handling timber. 4,242,037, Cl. 414-739.000.
Baur, Max, to Licinvest AG. Picture viewer. 4,241,529, Cl. 40-513.000.
Baxter, Ronald D.; and Freud, Paul J., to Leeds & Northrup Company. Thin film resistance thermometer detector probe assembly. 4,242,659, Cl. 338-28.000.
Baxter Travenol Laboratories, Inc.: *See*—
Greff, Richard; Wolf, Ludwig, Jr.; Munsch, John; and Kinney, Layton C., 4,242,310, Cl. 422-300.000.
Bayer Aktiengesellschaft: *See*—
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Fuchs, Rainer A.; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,242,357, Cl. 424-282.000.
Harms, Wolfgang; von Oertzen, Klaus; and Wunderlich, Klaus, 4,242,259, Cl. 260-153.000.
Konig, Eberhard; Schonfelder, Manfred; and Pedain, Josef, 4,242,410, Cl. 428-315.000.
Sylvester, Gerd; Witte, Josef; and Marwede, Gunter, 4,242,232, Cl. 252-429.00C.
Bayerische Motoren Werke Aktiengesellschaft: *See*—
Gratza, Peter; and Estel, Heinz, 4,241,933, Cl. 280-301.000.
Matyl, Franz; Klecker, Johann; and Sanguino-Alvarez, Guillermo, 4,241,593, Cl. 64-14.000.
Bayless, Allan V.; and Millner, Ozra E., Jr., to Morton-Norwich Products, Inc. Phosphorotriamides as urease inhibitors. 4,242,325, Cl. 424-210.000.
BBC Brown Boveri & Company Limited: *See*—
Bernasconi, Felix, 4,242,008, Cl. 403-13.000.
Kaufmann, Meinolph, 4,242,388, Cl. 428-35.000.
Koppl, Georg; Nowack, Helmut; and Carmelo, Violi, 4,242,549, Cl. 200-144.00R.
Moller, Wolfgang; and Schwarz, Hans, 4,241,958, Cl. 308-160.000.
Bean, Donald E., to Sperry Corporation. Current discharge fast time constant amplifier. 4,242,640, Cl. 328-187.000.
Beauchamp, Ronald A., to Boise Cascade Corporation. Composite container including a perforated label layer, and method and apparatus for forming the same. 4,241,834, Cl. 206-611.000.
Becker, James L. Display curtain. 4,241,527, Cl. 40-124.200.
Becker, William J.: *See*—
Hoover, Troy E.; Farber, Sheldon; and Becker, William J., 4,242,513, Cl. 544-345.000.
Beckers, Dieter: *See*—
Eisermann, Eckehard; and Beckers, Dieter, 4,241,905, Cl. 266-236.000.
Beckman Instruments, Inc.: *See*—
Gurske, William A., 4,242,298, Cl. 264-233.000.
Kampf, Richard S., 4,242,582, Cl. 250-328.000.
Kanda, Alvin F., 4,242,615, Cl. 315-169.100.
Beecham Group Limited: *See*—
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Behrenz, Wolfgang: *See*—
Fuchs, Rainer A.; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,242,357, Cl. 424-282.000.
Beidl, John R.; Criscimagna, Tony N.; and Greeson, James C., Jr., to International Business Machines Corporation. Multiple data line shift gas panel assembly. 4,242,680, Cl. 340-771.000.
Beisler, Alfons, to Velva AG. Two needle sewing machine. 4,241,677, Cl. 112-167.000.

Bell, Dwain C.; and Anderson, Lloyd E. Two-wheeled dolly. 4,241,930, Cl. 280-47.290.

Bell & Howell Company: *See*—
Flint, John R.; and Hertel, Heinz, 4,241,992, Cl. 355-41.000.

Bell, Oliver A., Jr.; Gilleland, Randall C.; and Chance, Davey J., to Colt Industries Operating Corp. Servo feed system for an electrical discharge machining apparatus. 4,242,560, Cl. 219-69.00G.

Bell Telephone Laboratories, Incorporated: *See*—
Berthold, Joseph E.; Hartman, Adrian R.; and Shackle, Peter W., 4,242,697, Cl. 357-49.000.
Cordell, Robert R., 4,242,650, Cl. 333-28.00R.
Dayem, Aly H.; Geballe, Theodore H.; Patel, Chandra K. N.; and Tien, Ping K., 4,242,419, Cl. 428-661.000.
Gagen, Paul F.; and Santana, Manuel R., 4,241,979, Cl. 350-96.230.
Gilmer, John L.; and Rizzo, Joseph F., 4,242,636, Cl. 328-63.000.
Laker, Kenneth R.; and Tow, Jimmy, 4,242,642, Cl. 330-109.000.

Belli, Aldo: *See*—
Venturello, Carlo; D'Aloisio, Rino; and Belli, Aldo, 4,242,524, Cl. 562-423.000.

Bellus, Daniel: *See*—
Martin, Pierre; Greuter, Hans; Steiner, Eginhard; and Bellus, Daniel, 4,242,278, Cl. 568-341.000.
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,242,264, Cl. 260-326.00C.

Bender, Emil A. Tandem long stroke reciprocating mud pump assembly. 4,242,057, Cl. 417-404.000.

Bendix Corporation, The: *See*—
Collins, Gordon T., 4,241,967, Cl. 339-59.00M.
Erwin, Louis R.; and Woodruff, Frank, 4,241,753, Cl. 137-116.300.
Han, Benjamin C. P.; and Weldy, Floyd P., 4,241,603, Cl. 73-129.000.
Hartford, Thomas W., 4,242,728, Cl. 364-431.000.
Peterson, William A., Jr.; and Marchak, Roman O., 4,241,710, Cl. 123-440.000.
Van De Sompele, Norman C., 4,241,813, Cl. 188-77.00R.
Weber, Robert E.; and Harper, Patrick D., 4,242,729, Cl. 364-431.000.

Bendix Westinghouse Limited: *See*—
Taig, Alistair G., 4,241,643, Cl. 91-446.000.

Benin, Joshua, to Du Pont de Nemours, E. I., and Company. Manually operated bobbin chuck. 4,241,883, Cl. 242-46.400.

Bennett, Clifford D.; and Odenthal, Charles, to C. R. Bard, Inc. Exhalation valve assembly. 4,241,756, Cl. 137-496.000.

Bennett, Robert A.; and Van Brocklin, Owen, to Bennett, Robert A. Liquid dispenser. 4,241,854, Cl. 222-207.000.

Benton, Stephen L.: *See*—
Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,241,847, Cl. 221-12.000.

Bergfeld, Manfred: *See*—
Battey, Paul K.; Bergfeld, Manfred; and Hope, Peter, 4,242,523, Cl. 560-48.000.

Bergkvist, Lars A. Arrangement at screens intended to give rise to a moire pattern. 4,242,000, Cl. 356-374.000.

Berglind, Eilert: *See*—
Henoch, Bengt T.; and Berglind, Eilert, 4,242,661, Cl. 340-23.000.

Bergman, Jack N.; and Ostrofsky, Bernard, to Standard Oil Company (Indiana). Tube internal measuring instrument. 4,241,609, Cl. 73-623.000.

Bergman, Ola, to Siemens Aktiengesellschaft. Method and circuit arrangement for switching signals having different transmission speeds within a program-controlled data exchange system. 4,241,802, Cl. 178-3.000.

Bergmann, Klaus; Schmitz, Friedrich; Kilian, Gottfried; and Reppel, Heinz, to Rheinische Kalksteinwerke GmbH. Bituminous mixed composition and filler for same containing non-hygroscopic crystal water-containing substances. 4,242,144, Cl. 106-281.00R.

Bergwerksverband GmbH: *See*—
Rohde, Wolfgang, 4,241,513, Cl. 34-10.000.

Berkman, Samuel: *See*—
United States of America, National Aeronautics and Space Administration; Berkman, Samuel; and Temple, Harold E., 4,242,553, Cl. 219-10.49R.

Bernasconi, Felix, to BBC Brown Boveri & Company Limited. Rigid coupling. 4,242,008, Cl. 403-13.000.

Berndtsson, Christer, to AGA Aktiebolag. Arrangement in respirators using a fluidistor to determine volume of air passed to a patient and pressure sensor to correct volume reading in terms of actual pressure. 4,241,732, Cl. 128-204.240.

Berrer, Dagmar; Lorenz, Joachim; and Grade, Reinhardt, to Ciba-Geigy Corporation. Agent for combating sea-water algae. 4,242,119, Cl. 71-67.000.

Berthereau, Gilbert: *See*—
Villard, Jean-Claude; and Berthereau, Gilbert, 4,242,039, Cl. 415-112.000.

Berthold, Joseph E.; Hartman, Adrian R.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. Dielectrically isolated high voltage semiconductor devices. 4,242,697, Cl. 357-49.000.

Bethlehem Steel Corporation: *See*—
Gee, Kenneth H.; and Kreiger, John W., 4,242,142, Cl. 106-97.000.

Bharteey, Brij M.: *See*—
Shariff, Sadiq A.; Wilson, John R.; Bharteey, Brij M.; and Rowe, Neal E., 4,242,718, Cl. 361-341.000.

Bijen, Jan M. J. M., to Stamicarbon, B.V. Process for the manufacture of articles of water-hardening material. 4,242,407, Cl. 428-247.000.

Billeter, Henry R., to Sloan Valve Company. Slow closing faucet. 4,241,759, Cl. 137-636.400.

Billington, Charles J. Conveyor assembly support structure and high strength tubular beam therefor. 4,241,826, Cl. 198-825.000.

Biondetti, Mario, to Escher Wyss Limited. Deflection compensating roll. 4,241,482, Cl. 29-116.0AD.

BioResearch: *See*—
Findl, Eugene; and Kurtz, Leonard D., 4,242,447, Cl. 435-39.000.

Biot, Bernard: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,242,203, Cl. 210-321.100.

Biran, Joseph, to Fairchild Camera & Instrument Corporation. Compensation of V_{BE} non-linearities over temperature by using high base sheet resistivity devices. 4,242,693, Cl. 357-28.000.

Birke, Walter: *See*—
Feess, Erich; Birke, Walter; and Steinbach, Joachim, 4,242,091, Cl. 8-444.000.

Black & Decker Inc.: *See*—
Sindelar, William F.; and Hetmanski, James R., 4,241,628, Cl. 81-9.510.

Blake, William S.: *See*—
Pauls, James D.; Hammett, Roy; and Blake, William S., 4,241,853, Cl. 222-207.000.

Blakely, Donald W., to Chevron Research Company. 65-130 Angstrom mean radius silica-alumina catalyst support. 4,242,236, Cl. 252-455.00R.

Blaskowski, Henry J., to Combustion Engineering, Inc. Coal feed system for a fluidized bed boiler. 4,241,670, Cl. 110-104.00R.

Blight, Graham J.: *See*—
Karsan, Demir I.; Blight, Graham J.; and Farmer, Larry E., 4,242,011, Cl. 405-204.000.

Bliss, Russell F. Cushioning for container. 4,241,832, Cl. 206-523.000.

Bloom, Allen; and Bartolini, Alfred, to RCA Corporation. Ablative optical recording medium. 4,242,689, Cl. 346-135.100.

Blount, David H. Production of amino-silicate compounds, condensation resinous products. 4,242,497, Cl. 528-232.000.

Blum, Albert. Apparatus for the removal of gases, especially air, in fluids. 4,242,289, Cl. 261-93.000.

Bobard, Charles E.; Delaunay, Just M.; and Darcy, Raymond M., to Etablissements Bobard Jeune. Grape gathering machine. 4,241,569, Cl. 56-330.000.

Bockno, Gregory C., to Avtex Fibers Inc. Viscose rayon and method of making same. 4,242,405, Cl. 428-224.000.

Bodycomb, Frederick M., Jr.; and Bauman, Glenn R., to Johns-Manville Corporation. Dust shroud for portable circular saw. 4,241,505, Cl. 30-390.000.

Boeddeker, David R.: *See*—
Wenger, Jerry A.; Clausen, Herman A.; Boeddeker, David R.; and Urch, Harvey M., 4,241,777, Cl. 160-135.000.

Boeing Company, The: *See*—
Chace, Richard A., 4,241,581, Cl. 60-538.000.
Cordner, Obrey, 4,241,508, Cl. 33-169.00B.
McArdle, Francis H., 4,242,048, Cl. 416-134.00A.
Olson, Elvin G., 4,242,158, Cl. 156-92.000.
Pearson, Raymond E., 4,241,890, Cl. 244-137.00R.

Bogerman, Pieter K.; Eygermans, Petrus J.; and van Velzen, Antoon G., to Gist-Brocades N.V. Novel enzyme particles and their preparation. 4,242,219, Cl. 252-174.120.

Boise Cascade Corporation: *See*—
Beauchamp, Ronald A., 4,241,834, Cl. 206-611.000.

Bolasco, Franco, to Mediolanum Farmaceutici S.r.L. 2-(2-Thenolythio)-propionylglycine: method for its preparation and pharmaceutical formulations containing said compound. 4,242,354, Cl. 424-275.000.

Boller, Peter K., to Consumers Glass Company Ltd. Severable connecting means. 4,241,841, Cl. 215-252.000.

Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, to GAF Corporation. High-strength glass fiber mat particularly useful for roofing products. 4,242,404, Cl. 428-220.000.

Boone Box Co.: *See*—
Morris, Ivan B., 4,241,892, Cl. 248-346.000.

Boone, Gary W.; and Cochran, Michael J., to Texas Instruments Incorporated. Display and keyboard scanning for electronic calculation or the like. 4,242,675, Cl. 340-711.000.

Boone, James G., to NCR Corporation. Digital phase lock circuit. 4,242,639, Cl. 328-155.000.

Borg-Warner Corporation: *See*—
Smirl, Richard L., 4,241,618, Cl. 74-863.000.
Wiese, Winfred J., 4,241,927, Cl. 277-87.000.

Borgren, Peter M., to Hydrodynamic Energy Systems Corporation. Apparatus for producing electrical energy from multidirectional water wave action. 4,241,579, Cl. 60-504.000.

Borsig GmbH: *See*—
Eiermann, Dankwart, 4,241,758, Cl. 137-512.150.

Bosch-Siemens Hausgerate GmbH: *See*—
Aschberger, Matthias; and Link, Dieter, 4,242,116, Cl. 62-199.000.
Dienemann, Wolfgang; and Reichert, Rudolf, 4,241,587, Cl. 62-80.000.

Bossinger, Charles D.: *See*—
Colescott, Robert L.; Kaiser, Emil; and Bossinger, Charles D., 4,242,238, Cl. 260-8.000.

Bottelsen, Robert A.: *See*—
Wu, Samuel C.; Holick, Stephen A.; and Bottelsen, Robert A., 4,241,821, Cl. 194-4.00C.

Bourdelle, Peter A.; and Schiff, Norman, to Johnson & Johnson. Compact sheath package for medical instruments. 4,241,828, Cl. 206-306.000.

Bourne, Richard G.: *See*—
Buddemeyer, Bruce D.; Neville, William A.; Taylor, James S.; and Bourne, Richard G., 4,242,364, Cl. 426-98.000.

Boutle, David L., to Poryair Limited. Production of porous materials. 4,242,464, Cl. 521-61.000.

Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Apparatus for the pointwise scanning of an information surface. 4,242,579, Cl. 250-201.000.

Bove', Louis J. Rainwater ducting system. 4,241,547, Cl. 52-11.000.

Bowen, Glen L.: *See*—
Karaba, Albert M.; Kauffman, Brian C.; and Bowen, Glen L., 4,241,705, Cl. 123-78.00B.

Bradford, Randol W.; and Carmichael, Michael H., to Freeport Minerals Company. Sulfur mine bleedwater reuse system. 4,241,953, Cl. 299-4.000.

Bradham, Allen C., III, to Badger Meter, Inc. Mass rate flow meter. 4,241,613, Cl. 73-861.710.

Brahm, Jacques; and De Rath, Jean-Pierre, to Solvay & Cie. Process for the preparation of aqueous suspensions containing at least 65% by weight of calcium carbonate. 4,242,318, Cl. 423-430.000.

Braines, George E.: *See*—
Daly, Andrew S.; May, Peter R.; and Braines, George E., 4,241,845, Cl. 220-203.000.

Brambring, Jorg; and van der Ven, Robert F. L. M., to U.S. Philips Corporation. CRT Control grid having orthogonal openings on opposite sides. 4,242,613, Cl. 313-447.000.

Brammall, Inc.: *See*—
Van Gompel, James, 4,241,595, Cl. 70-347.000.

Brandeau, Edward P., to Akzona Incorporated. Device and method for terminating a flat cable. 4,241,498, Cl. 29-861.000.

Brandis, Helmut; Weigand, Hans H.; and Spyra, Wolfgang, to Thyssen Edelstahlwerke AG. High-speed steel. 4,242,130, Cl. 75-126.00C.

Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls Company. Fluid flow sensing switch device. 4,242,082, Cl. 431-72.000.

Braun AG: *See*—
Fahrenschon, Kurt, 4,242,747, Cl. 368-242.000.

Braun, David B.; Drap, Stephen; Fritz, Henry E.; and Ingberman, Arthur K., to Union Carbide Corporation. Transport of aqueous coal slurries. 4,242,098, Cl. 44-51.000.

Bredemus, Leonard N. Door latching mechanism. 4,241,888, Cl. 292-165.000.

Breitmeyer, Alexander M.: *See*—
Koutsky, Louis J.; and Breitmeyer, Alexander M., 4,241,893, Cl. 248-425.000.

Breitweg, Werner: *See*—
Deininger, Horst; and Breitweg, Werner, 4,241,804, Cl. 180-79.100.

Brennan, John R., to Arnaco Inc. Multiple cup downweil gas separator. 4,241,788, Cl. 166-105.500.

Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, to Wulfing, Johann A. 7-(Oxoalkyl)-1,3-dialkyl xanthines, and medicaments containing them. 4,242,345, Cl. 424-253.000.

Brent, Rachael E. Stringed musical instruments of guitar type. 4,241,637, Cl. 84-1.160.

Bricker, Charles E., to Dayco Corporation. Method for making curved hose. 4,242,296, Cl. 264-149.000.

Bridgestone Tire Company Limited: *See*—
Hoshino, Takashi; Imaizumi, Setsuko; and Tomita, Seisuke, 4,242,472, Cl. 525-343.000.

Brigham, Ward E.: *See*—
Douma, William L.; and Brigham, Ward E., 4,242,725, Cl. 362-341.000.

Brinkmann, Willi: *See*—
Stratmann, Josef; and Brinkmann, Willi, 4,242,027, Cl. 414-148.000.

British Petroleum Company Limited, The: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,242,233, Cl. 252-431.00N.

Britz, Hans E. Opto-electronic antenna system. 4,242,578, Cl. 455-611.000.

Broadway, William W.: *See*—
Sternenberg, James E.; and Broadway, William W., 4,241,895, Cl. 251-173.000.

Bron, Dan. Flow regulator. 4,241,757, Cl. 137-501.000.

Brooking, Betty L.: *See*—
Morgan, Jay E.; DelVecchio, Anthony J.; Brooking, Betty L.; and Laverty, David M., 4,242,366, Cl. 426-554.000.

Brouwer, Gerald A., to Lear Siegler, Inc., Rapistan Division. Pivoted gimbel bearing for rollers. 4,241,825, Cl. 198-782.000.

Brown, Ian G., to Xerox Corporation. Photocopying machine. 4,241,991, Cl. 355-26.000.

Brown, Joseph W. Bellows type incentive spirometer. 4,241,740, Cl. 128-728.000.

Brown, Robert S., III. Regeneration of scrubber effluent containing sulfate radicals. 4,242,448, Cl. 435-42.000.

Brown & Root, Inc.: *See*—
Karsan, Demir I.; Blight, Graham J.; and Farmer, Larry E., 4,242,011, Cl. 405-204.000.

Brown, Trevor J., to General Motors Corporation. Wheel cover retention arrangement. 4,241,954, Cl. 301-37.00R.

Bruce, Arthur P.: *See*—
Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P., 4,241,847, Cl. 221-12.000.

Brunetti, Francesco: *See*—
Gasperini, Pietro; and Brunetti, Francesco, 4,242,093, Cl. 8-456.000.

Bruning, Hugo A. C. M.; van Vucht, Johannes H. N.; Westendorp, Frans F.; and Zijlstra, Hinne, to U.S. Philips Corporation. Hydrides of the formula AB_nH_m. 4,242,315, Cl. 423-252.000.

Buchreiter, Georg; Kniep, Peter; Scheinost, Kurt; and Vollbrecht, Heinz-Rudiger, to SKW Trostberg Aktiengesellschaft. Process for production of cyanogen chloride. 4,242,319, Cl. 423-383.000.

Buckler, Sheldon A.; Cohen, Fredric S.; and Kennedy, David P., to Polaroid Corporation. Flat battery. 4,242,424, Cl. 429-152.000.

Buckner, Walter E., to Lucky Manufacturing Co., Inc. Brake mechanism for a gondola car loader. 4,241,811, Cl. 188-43.000.

Buckwalter, Nevin. Fluid jet device. 4,241,464, Cl. 239-251.000.

Bucolo, Giovanni: *See*—
Madappally, Mathew M.; and Bucolo, Giovanni, 4,242,446, Cl. 435-15.000.

Budai, Karoly, to Chyron Corporation. Digital scene storage. 4,242,707, Cl. 358-280.000.

Budd Canada Inc.: *See*—
Kendall, Willard E., 4,242,564, Cl. 219-208.000.

Buddemeyer, Bruce D.; Neville, William A.; Taylor, James S.; and Bourne, Richard G., to R.G.B. Laboratories, Inc. Dry powdered non-dairy food composition containing liquid fat. 4,242,364, Cl. 426-98.000.

Buehner, Joseph F. Anti-jackknife device for tractor-trailer combination. 4,241,934, Cl. 280-432.000.

Buhrer, Erwin. Method and apparatus for the removal of sand bales containing castings from molding boxes of poured foundry molds. 4,241,778, Cl. 164-131.000.

Bullen, Ronald S. Well tree saver. 4,241,786, Cl. 166-77.000.

Bunker Ramo Corporation: *See*—
Ayer, George E., 4,241,972, Cl. 339-126.00R.
Krolak, Ronald F.; Perna, Jay; and Radloff, Frederick J., 4,242,721, Cl. 361-415.000.

Burchell, Stanley C., to Allstar Fasteners, Inc. Adjustable shank slot dial. 4,241,468, Cl. 10-169.000.

Burenkov, Nikolai A.; Derevyanchenko, Mikhail G.; Ioganson, Rikhard A.; Kuprianov, Alexandr V.; Perchenok, Mark B.; Chegodaev, Evgeny V.; and Chulin, Valentin I. Water-cooled electromagnetic brake. 4,242,609, Cl. 310-105.000.

Burgdorf, Jochen; Lupertz, Hans-Henning; and Kast, Helmut, to ITT Industries, Inc. Brake shoe for a spot-type disc brake. 4,241,812, Cl. 188-73.100.

Burns, Daniel J., to United States of America, Air Force. Apparatus and method for integrated circuit test analysis. 4,242,635, Cl. 324-158.00R.

Bursk, William M., to Pease Company. Door light assembly. 4,241,556, Cl. 52-455.000.

Bushnell, Donald D. Elastic apparatus for resisting and assisting a person performing exercises. 4,241,914, Cl. 272-136.000.

Bussell, Ray V.: *See*—
Voege, Clayton B., 4,241,896, Cl. 251-206.000.

Buta, John R.; Gehring, John H.; and Drotleff, Thomas J., to Paxson Machine Company. Apparatus for palletizing sheet material. 4,242,024, Cl. 414-43.000.

Butruille, Yves: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,242,203, Cl. 210-321.100.

Butts, Gene A.: *See*—
Golias, Tipton; Butts, Gene A.; and Swift, Robert A., 4,242,730, Cl. 364-416.000.

Bzik, John W.: *See*—
Zuckerman, Joseph L.; and Bzik, John W., 4,242,395, Cl. 428-96.000.

C. Itoh Electronics, Inc.: *See*—
Kondur, Nicholas, Jr., 4,242,005, Cl. 400-220.100.
Kondur, Nicholas, Jr., 4,242,006, Cl. 400-568.000.

C. R. Bard, Inc.: *See*—
Bennett, Clifford D.; and Odenthal, Charles, 4,241,756, Cl. 137-496.000.
Elson, Edward E., 4,241,739, Cl. 128-725.000.

C.V.P. Systems, Inc.: *See*—
Gidewall, Kenneth L.; and Proce, James R., 4,241,558, Cl. 53-79.000.

Cabados, Rick H.; and Hansen, Robert E. Spill proof bong. 4,241,741, Cl. 131-173.000.

Cable, Harold E., to Weld Tooling Corporation. Formable drive rails. 4,241,664, Cl. 104-118.000.

Cale, Albert D., Jr., to A. H. Robins Company, Inc. Production of methylene-cycloamines. 4,242,261. Cl. 260-239.00A.

Callahan, John A.; and Ottenstein, Allan S., to RF Products Corp. Gasoline pump digital price encoder. 4,242,575, Cl. 235-92.0FL.

Campbell, Kenneth J., to United States of America, Navy. Commutating narrowband filter. 4,242,732, Cl. 364-485.000.

Canada, Her Majesty the Queen in right of: *See*—
Slaght, William F., 4,242,036, Cl. 414-737.000.

Canada Wire and Cable Limited: *See*—
Halasz, Joseph; and Ito, Rokuzo, 4,241,573, Cl. 57-127.700.

Canadian Patents and Development Limited: *See*—
Siemsen, Klaus J.; and Reid, John, 4,242,645, Cl. 331-94.50G.

Canfield, V. Robert: *See*—
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,242,404, Cl. 428-220.000.

Cannella, Vincent D.: *See*—
Izu, Masatsugu; and Cannella, Vincent D., 4,242,439, Cl. 430-346.000.

Cano, Francis J.; Kuo, Joseph S. C.; and Querry, Merle V., to American Cyanamid Company. Purification of pneumococcal capsular polysaccharides. 4,242,501, Cl. 536-1.000.

Canon Kabushiki Kaisha: *See—*
Kitagishi, Nozomu, 4,241,983, Cl. 350-216.000.
Canron Corporation: *See—*
Lund, Raymond R.; and Ho, Hung C., 4,241,663, Cl. 104-16.000.
Canterino, Peter J., to Mobil Oil Corporation. Fire resistant foam insulation. 4,242,465, Cl. 521-88.000.
Cappon, Arthur M.; Collins, John D.; and Sage, Jay P., to Raytheon Company. Signal processor. 4,242,683, Cl. 343-7.700.
Carduck, Franz-Josef; Drager, Axel; Effey, Gunter; Majmudar, Suresh; and Witthaus, Martin, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Apparatus for ozonizing unsaturated compounds. 4,242,309, Cl. 422-189.000.
Carl Hurth Maschinen-und Zahnradfabrik: *See—*
Leiber, Wolfgang; and Ruesch, Hans J., 4,241,817, Cl. 192-12.00C.
Carl Still, Firma: *See—*
Stratmann, Josef; and Brinkmann, Willi, 4,242,027, Cl. 414-148.000.
Carlingswitch, Inc.: *See—*
Sorenson, Richard W., 4,242,551, Cl. 200-302.000.
Carlson, David J.; and Yu, John P., to RCA Corporation. RF Connector assembly with low frequency isolation. 4,242,655, Cl. 333-183.000.
Carlsson, Knut G., to A/S De Smithske. Apparatus for taking up oil from a water surface. 4,242,202, Cl. 210-242.300.
Carmelo, Violi: *See—*
Koppl, Georg; Nowack, Helmut; and Carmelo, Violi, 4,242,549, Cl. 200-144.00R.
Carmichael, Michael H.: *See—*
Bradford, Randol W.; and Carmichael, Michael H., 4,241,953, Cl. 299-4.000.
Carolan, Donald L., to Deere & Company. Lawn mower safety shield. 4,241,567, Cl. 56-17.400.
Carpenter, Rodney W., to Clayton & Lambert Manufacturing Company. Anti-pollution rotary-sweep grain drier. 4,241,517, Cl. 34-79.000.
Carroll, Wilfred J. Supply container mounting. 4,241,668, Cl. 108-26.000.
Carruthers, John A.; and Austin, Michael J., to Carruthers, John Abbott. Trailer couplings. 4,241,936, Cl. 280-507.000.
Carruthers, John Abbott: *See—*
Carruthers, John A.; and Austin, Michael J., 4,241,936, Cl. 280-507.000.
Carson, Charles: *See—*
Corbin, Lawrence W.; and Carson, Charles, 4,241,625, Cl. 76-107.00A.
Carter, Cecil O., to Phillips Petroleum Company. Olefin dimerization. 4,242,531, Cl. 585-512.000.
Carter, Robert A., to General Electric Company. Electrically heated hair straightener and PTC heater assembly therefor. 4,242,567, Cl. 219-225.000.
Carter, Sidney T., to A-T-O Inc. Labeling machine. 4,242,168, Cl. 156-357.000.
Caruel, Jacques E. J.; Stora, Guy D.; and Schmitt, Gilles M.-J. B., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Combustion chamber of gas turbine engines. 4,241,586, Cl. 60-738.000.
Carver, Bobby C., to Eastman Kodak Company. Yarn lubricants. 4,242,095, Cl. 8-115.600.
Castillo, Adolfo; Kushner, Ben; and Seipos, Andrew G., to Automated Building Components, Inc. Assembly machine and method for embedding connector plates in structural members. 4,241,651, Cl. 100-35.000.
Catalyst Research Corporation: *See—*
O'Boyle, Matthew; Icore, Bernard; and Harney, Marilyn J., 4,242,425, Cl. 429-181.000.
Caterpillar Tractor Co.: *See—*
Meisel, Thomas C., Jr., 4,241,956, Cl. 305-35.0EB.
CCL Systems, Limited: *See—*
Edwards, Hugh J. W., 4,241,490, Cl. 29-459.000.
Celotex Corporation, The: *See—*
Rosen, Murray; Koenig, Alan R.; and Copham, John D., 4,242,241, Cl. 260-17.200.
Centre Electronique Horloger SA: *See—*
Piguet, Christian; and Perotto, Jean-Felix, 4,242,676, Cl. 340-711.000.
Cerny, Arnost; and Janecek, Jaroslav, to Adamovske Strojirny, Narodni Podnik. Device for taking up the clearance of gear transmissions. 4,241,619, Cl. 74-440.000.
Cerny, Jacqueline; and Vivant, Gilbert, to Rhone-Poulenc Industries. Compositions intended for the flameproofing of plastics. 4,242,240, Cl. 260-14.000.
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Graham, Kenneth A., 4,241,484, Cl. 29-156.40R.
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Clark, Robert H., to McGraw-Edison Company. Electric skillet having removably attachable handle. 4,242,570, Cl. 219-441.000.
Clarke, John A., to Mineral Process Licensing Corporation. Reduction of ferric chloride. 4,242,320, Cl. 423-493.000.
Clarke, Peter A.: *See*—
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Clement, Clyde H. Self-loading car-top carrier for wheelchairs or similar sized loads. 4,242,030, Cl. 414-462.000.
Clewett, Merle E., to Union Iron Works, Inc. Chain drag kit for conveyor. 4,241,823, Cl. 198-727.000.
Cobb, Richard H. Method and apparatus for simultaneous distribution of poultry feed. 4,241,700, Cl. 119-52.0AF.
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Colescott, Robert L.; Kaiser, Emil; and Bossinger, Charles D., to Armour and Company. Synthesis of peptides. 4,242,238, Cl. 260-8.000.
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Consumers Glass Company Ltd.: *See*—
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Kushmuk, Walter P., 4,241,801, Cl. 177-211.000.
Conway, Charles S. Liquid cargo tank construction. 4,241,683, Cl. 114-74.00R.
Cool, John K.: *See*—
Levinson, Leon A.; and Cool, John K., 4,242,701, Cl. 358-75.000.
Cooper, George W.; and Young, Ronald J., to Cornell Research Foundation, Inc. Spermicidal agents. 4,242,359, Cl. 424-325.000.
Cooper, Glenn F., to American District Telegraph Company. Optical particle detector. 4,242,673, Cl. 340-630.000.
Cooper, James J., Jr., to International Telephone and Telegraph Corporation. Cast bus bar connector having hollow cross-sectional area. 4,241,975, Cl. 339-242.000.
Coors Container Company: *See*—
Wu, Samuel C.; Holick, Stephen A.; and Bottelsen, Robert A., 4,241,821, Cl. 194-4.00C.
Copham, John D.: *See*—
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Corbin, Lawrence W.; and Carson, Charles, to Fort Wayne Wire Die, Inc. Method of making a wire drawing die. 4,241,625, Cl. 76-107.00A.
Cordell, Robert R., to Bell Telephone Laboratories, Incorporated. Active variable equalizer. 4,242,650, Cl. 333-28.00R.
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Costa, Eugene, Jr.; and Godsay, Madhu P., to International Paper Company. High crimp, high strength, hollow rayon fibers. 4,242,411, Cl. 428-369.000.
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Coulter Electronics, Inc.: *See*—
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Coulter Systems Corp.: *See*—
Kuehnle, Manfred R.; and Hagenlocher, Arno K., 4,242,433, Cl. 430-67.000.
Courtoy, Jean-Francois. Treatment of non-woven fabric in order to improve the properties thereof. 4,242,380, Cl. 427-366.000.
Cousins, Rebecca A. Universal racket rack. 4,241,836, Cl. 211-14.000.
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Curry, Paul F., to Jem Corporation. Ski board with improved foot treads. 4,241,929, Cl. 280-12.00H.
Cusano, Dominic A.; Holub, Fred F.; and Prochazka, Svante, to General Electric Company. Ceramic-like scintillators. 4,242,221, Cl. 252-301.40H.
CY/RO Industries: *See*—
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Daly, Andrew S.; May, Peter R.; and Braines, George E., to A.S. Daly Nominees Pty. Ltd. Radiator caps. 4,241,845, Cl. 220-203.000.

D'Amato, Michael J.; and Jaconette, Frank C., to Harvey Hubbell, Incorporated. Locking plug. 4,241,969, Cl. 339-88.00R.

Danfoss A/S: *See*—
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Danner, Edward L.: *See*—
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Daswick, Alexander C. Shoe sole structure. 4,241,523, Cl. 36-30.00R.

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Davies, David R.; and Richardson, Edwin A., to Shell Oil Company. Method for diverting a gaseous sand-consolidating fluid. 4,241,791, Cl. 166-292.000.

Davis, Chester. Additive system of color photography based on iridescent pigments. 4,242,428, Cl. 430-9.000.

Davis, Dan B. Tiller steering lock. 4,241,684, Cl. 114-144.00R.

Davison, Sol: *See*—
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Dayco Corporation: *See*—
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Deacon, James S., to McLaughlin, Inc. Dust collector. 4,242,114, Cl. 55-304.000.

Deal, Bruce C., to Northrop Corporation. Image spot detector using Haar coefficients. 4,242,733, Cl. 364-515.000.

Deal, Bruce C., to Northrop Corporation. Image corner detector using Haar coefficients. 4,242,734, Cl. 364-515.000.

Dean, Paul R., II; and Kuczkowski, Joseph A., to Goodyear Tire & Rubber Company, The. Color stabilization of amine antioxidant and antiozonant emulsions. 4,242,224, Cl. 252-402.000.

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Dees, Raymond K.; Van Laanen, Peter J.; and Ream, Gregory L., to Unirad Corporation. Ultrasonic scanner. 4,241,608, Cl. 73-606.000.

De Fazio, Thomas L., to Charles Stark Draper Laboratory, Inc., The. Passive mating system. 4,242,017, Cl. 408-111.000.

Defibaugh, George R.; Shannon, Suel G.; and Swengel, Robert C., Jr., to AMP Incorporated. Connection of wires to components having two prongs. 4,242,535, Cl. 174-88.00R.

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DeHaven, William M., to Harrelson Rubber Company. Tire retreading apparatus. 4,242,169, Cl. 156-394.000.

Deimel, Gerhard; and Schmidt, Paul, to Jagenberg Werke AG. Apparatus for folding and closing the tops of folding cartons. 4,241,560, Cl. 53-373.000.

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Delpretti, Roger, to Ateliers des Charmilles S.A. Process and apparatus for eliminating short circuits in electrical discharge machining. 4,242,555, Cl. 219-69.00M.

De Luca, Charles G. Trimmer blade. 4,241,633, Cl. 83-676.000.

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DeMarinis, Robert M., to SmithKline Corporation. Bis-2N-alkylene tetrahydroisoquinoline compounds. 4,242,346, Cl. 424-258.000.

Demi, Roy C., to Robertshaw Controls Company. Fluid flow sensing switch device. 4,242,083, Cl. 431-72.000.

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DePouilly, Bernard M. H.; and Issenmann, Edouard M. J. A. I., to Le Material Telephonique. Clock recovery system for data receiver. 4,242,754, Cl. 375-110.000.

Depperman, Warren B., to Chamberlain Manufacturing Corporation. Folding screw and rail assembly for a garage door opener. 4,241,540, Cl. 49-199.000.

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Detweiler, Charles A., to Schmelzer Corporation. Fuel control system. 4,241,711, Cl. 123-559.000.

Deuterium Corporation: *See*—
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deVos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Products Corporation. Luminaire reflector. 4,242,727, Cl. 362-346.000.

Dickens, Luther I.; and Nanny, William C., to Radva Plastics Corporation. Composite panel structure and method of manufacture. 4,241,555, Cl. 52-454.000.

Dickinson, Norman L. Pollutant-free low temperature combustion process having carbonaceous fuel suspended in alkaline aqueous solution. 4,241,722, Cl. 126-263.000.

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Eschner, Axel; and Pohlmann, Erich, 4,241,781, Cl. 165-1.000.

Diehl GmbH & Co.: *See*—
Rudenauer, Werner; and Siewert, Ralf, 4,241,662, Cl. 102-210.000.

Diem, Hans; Dudeck, Christian; Lehmann, Gunter; Matthias, Guenther; and Petri, Norbert, to BASF Aktiengesellschaft. Preparation of glyoxal. 4,242,282, Cl. 568-471.000.

Dienemann, Wolfgang; and Reichert, Rudolf, to Bosch-Siemens Hausgerate GmbH. Refrigerating apparatus, especially refrigerator or freezer. 4,241,587, Cl. 62-80.000.

Di Gesu', Giovanni, to Indesit Industria Elettrodomestici Italiana S.p.A. Packing system. 4,241,830, Cl. 206-422.000.

Diguet, Daniel; David, Gerard A.; and Aubril, Pierre, to U.S. Philips Corporation. Method of forming a contact on the surface of a semiconductor body by serigraphy and body obtained by means of this method. 4,242,696, Cl. 357-30.000.

Dilo, Richard. Needle felt machine with a guiding apparatus for the needle beam. 4,241,479, Cl. 28-107.000.

Dimsdale, Michael J., to Synthelabo. 3-Amino-5-benzyl-1,2,4-oxadiazoles and anti-hypertensive compositions thereof. 4,242,352, Cl. 424-272.000.

Dingman, Arthur E., to Autographic Business Forms, Inc. Printer with indexed orientation of print head relative to web movement. 4,241,655, Cl. 101-79.000.

Dingwall, Andrew G. F., to RCA Corporation. Look ahead high speed circuitry. 4,242,738, Cl. 365-189.000.

Dionex Corporation: *See*—
Rich, William E., Jr.; Johnson, Edward L.; and Sidebottom, Thomas O., 4,242,097, Cl. 23-230.00R.

Dittler Brothers, Inc.: *See*—
Bachman, Gilbert, 4,241,942, Cl. 283-6.000.

Dittrich, Ewald: *See*—
Christner, Hans; Roebke, Wolfgang; Ramelow, Hermann; and Dittrich, Ewald, 4,242,223, Cl. 252-313.00R.

Dobson, John V., to National Research Development Corporation. Apparatus for measuring the concentrations of ions. 4,242,189, Cl. 204-195.00R.

Dochia, Mihail: *See*—
Popovici, Neculai; Dochia, Mihail; Dumitrescu, Mihai; Spirea, Iosif; and Samoil, Iacob, 4,242,308, Cl. 422-195.000.

Dockner, Toni; Frank, Anton; Kempe, Uwe; Wetzler, Matthias; and Karn, Helmut, to BASF Aktiengesellschaft. Process for preparing 4-methyl-5[(2-aminoethyl)thiomethyl)]-imidazole. 4,242,517, Cl. 548-342.000.

Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG: *See*—
Schindler, Johannes G.; and Schal, Wilfried, 4,242,191, Cl. 204-195.00M.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Schellmann, Klaus; and Schulze, Heinz, 4,241,709, Cl. 123-407.000.

Dodson, Stuart A.: *See*—
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,337, Cl. 424-248.540.
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,338, Cl. 424-248.540.
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,339, Cl. 424-248.540.
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,340, Cl. 424-248.540.

Dodt, Jurgen: *See*—
Plevak, Lubomir; and Dodt, Jurgen, 4,242,014, Cl. 405-300.000.

Doebel, David H. Concave helix solar concentrator. 4,241,726, Cl. 126-438.000.

Dolikian, Arman V.; and Freeburg, Thomas A., to Motorola, Inc. Radio transmitter time out timer. 4,242,753, Cl. 375-70.000.

Doll, Joseph D., to Lockwood Corporation. Over-power safety device for motor driven system. 4,242,712, Cl. 361-42.000.

Dolveck, Gilbert, to Aluminium Suisse S.A. Aerosol dispensing and similar metal cans, and process for the production thereof. 4,241,844, Cl. 220-67.000.

Domtar Inc.: *See*—
Doutre, Joseph A. M., 4,241,474, Cl. 19-26.000.

Donaldson Company, Inc.: *See*—
Harold, Donald M.; and Ufken, Gregory A., 4,242,115, Cl. 55-347.000.

Donnelly, Donald E.; and Feero, William B., to Emerson Electric Co. Oil burner primary control for interrupted ignition system. 4,242,081, Cl. 431-71.000.

Donovan, William F., to United States of America, Army. Projectile. 4,241,660, Cl. 102-56.00R.

Doring, Michael, to U.S. Philips Corporation. Ink jet printer. 4,242,688, Cl. 346-75.000.

Dossett, Richard A.: *See*—
Grimm, Bernard J.; and Dossett, Richard A., 4,241,589, Cl. 62-265.000.

Douglas, George H.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Method for treatment of diarrheal disease conditions or symptons in mammals. 4,242,337, Cl. 424-248.540.

Douglas, George H.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Method for treatment of gastrointestinal secretory and ulcerogenic disease conditions or symptoms in mammals. 4,242,338, Cl. 424-248.540.

Douglas, George H.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Method for treatment of gastrointestinal spasmodic disease conditions or symptoms in mammals. 4,242,339, Cl. 424-248.540.

Douglas, George H.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Method for the treatment of diarrheal disease conditions and symptoms in mammals. 4,242,340, Cl. 424-248.540.

Douglass, David H., to University of Rochester, The. Methods and apparatus for providing ultra-stable frequency standards and clocks. 4,242,611, Cl. 310-344.000.

Douma, William L.; and Brigham, Ward E., to Sun Chemical Corporation. Light reflector structure. 4,242,725, Cl. 362-341.000.

Doutre, Joseph A. M., to Domtar Inc. Mobile flax decorticator. 4,241,474, Cl. 19-26.000.

Dow Chemical Company, The: *See*—
Clarey, Donald H., 4,241,507, Cl. 33-125.00R.
Evani, Syamalarao; and Foster, William A., 4,242,408, Cl. 428-290.000.
Kyriacou, Demetrios, 4,242,183, Cl. 204-73.00R.
Nestrick, Terry J.; and Stehl, Rudolph H., 4,242,227, Cl. 252-428.000.
Renga, James M., 4,242,285, Cl. 260-348.310.

Dow Corning Corporation: *See*—
Baney, Ronald H.; and Harris, Len A., 4,242,416, Cl. 428-412.000.

Dow, Julian: *See*—
Specht, Donald F.; and Dow, Julian, 4,241,611, Cl. 73-626.000.

Dowd, Daniel J., to Westvaco Corporation. Paper plate forming method and apparatus. 4,242,293, Cl. 264-40.700.

Dracon Industries: *See*—
Gregson, Donald L., 4,241,496, Cl. 29-751.000.

Drager, Axel: *See*—
Carduck, Franz-Josef; Drager, Axel; Effey, Gunter; Majmudar, Suresh; and Witthaus, Martin, 4,242,309, Cl. 422-189.000.

Dragerwerk Aktiengesellschaft: *See*—
McBride, William S., 4,241,485, Cl. 29-157.00R.

Drap, Stephen: *See*—
Braun, David B.; Drap, Stephen; Fritz, Henry E.; and Ingberman, Arthur K., 4,242,098, Cl. 44-51.000.

Dreiling, James A., to Honeywell Inc. Tape recording apparatus using capacitive detectors as tape position sensors. 4,242,708, Cl. 360-74.500.

Drotleff, Thomas J.: *See*—
Buta, John R.; Gehring, John H.; and Drotleff, Thomas J., 4,242,024, Cl. 414-43.000.

D'Silva, Thomas L., to GTE Products Corporation. Cadmium-free silver based brazing alloy. 4,242,134, Cl. 75-173.00C.

Du Pont Canada Inc.: *See*—
Urquhart, Thomas, 4,242,295, Cl. 264-146.000.

DuBois, Edmund H.; Erlandson, Robert K.; and Miller, Allan F., to Outboard Marine Corporation. Throttle control for a marine propulsion device. 4,241,687, Cl. 440-63.000.

Du Bois, Edward F., to Singer Company, The. P.C. Board lead trimming method. 4,241,497, Cl. 29-839.000.

Dubois, Jean-Claude; and Mourgues, Gerard, to U.S. Philips Corporation. Coupling device for connecting a light source to an optical fiber. 4,241,978, Cl. 350-96.200.

Dubourg, Michel, to Framatome. Filters for purifying fluids containing ferromagnetic particles. 4,242,200, Cl. 210-222.000.

Dudeck, Christian: *See*—
Diem, Hans; Dudeck, Christian; Lehmann, Gunter; Matthias, Guenther; and Petri, Norbert, 4,242,282, Cl. 568-471.000.

Dudley, Dana: *See*—
McCormack, Kent; Robinson, James E.; Knight, William M., Jr.; and Dudley, Dana, 4,242,706, Cl. 358-213.000.

Dufresne, Armand F. Multi-symbol message communicator for a speechless, handicapped person. 4,241,521, Cl. 434-112.000.

Dugas, Madeleine L.: *See*—
Wolf, Robert H.; and Dugas, Madeleine L., 4,241,867, Cl. 235-85.00R.

Dulmison (Australia) Pty. Ltd.: *See*—
Hearnshaw, David, 4,242,537, Cl. 174-42.000.

Dumitrescu, Mihai: *See*—
Popovici, Neculai; Dochia, Mihail; Dumitrescu, Mihai; Spirea, Iosif; and Samoil, Iacob, 4,242,308, Cl. 422-195.000.

Dumont, Claude: *See*—
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,242,355, Cl. 424-275.000.

Duncan, Joe S.: *See*—
Emerson, Roy J.; Fabris, Hubert J.; Herold, Robert J.; and Duncan, Joe S., 4,242,490, Cl. 528-77.000.

Dunkl, Franz S.: *See*—
Ross, Sidney D.; Finkelstein, Manuel; and Dunkl, Franz S., 4,242,722, Cl. 361-433.000.

Dunlop Limited: *See*—
Jackson, William L., 4,241,775, Cl. 152-330.0RF.
Stewart, Charles G., 4,241,776, Cl. 152-381.400.

Dunn, Aubrey J.: *See*—
King, Gerard J.; and Dunn, Aubrey J., 4,242,149, Cl. 148-1.500.

Dunning, Beverly W., Jr.; and Chambers, D. Harry, to United States of America, Interior. Electrolytic stripping cell. 4,242,192, Cl. 204-213.000.

Duphar International Research B.V.: *See*—
van Dijk, Jan; and Zwagemakers, Johannes M. A., 4,242,348, Cl. 424-267.000.

Du Pont de Nemours, E. I., and Company: *See*—
Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., 4,242,243, Cl. 260-23.0AR.
Benin, Joshua, 4,241,883, Cl. 242-46.400.
Yallourakis, Michael D., 4,242,253, Cl. 260-40.0TN.

Durad Machine Company, Ltd.: *See*—
Mohrsen, Leif, 4,242,023, Cl. 414-36.000.

Dutta Roy, Suhash C., to Iowa State University Research Foundation, Inc. Wideband transformer apparatus. 4,242,651, Cl. 333-32.000.

Dyhr, Jan; and Nissen, Ole J., to Danfoss A/S. Encapsulated refrigerator. 4,242,056, Cl. 417-363.000.

E. J. Price (Developments) Limited: *See*—
Price, Ernest J., 4,242,060, Cl. 417-464.000.

E M I Limited: *See*—
Smith, Andrew L.; and Claes, Paul E., 4,242,400, Cl. 428-201.000.

E. R. Squibb & Sons, Inc.: *See*—
Wade, Peter C.; and Ondetti, Miguel A., 4,242,265, Cl. 260-326.12R.

Eames, Thomas R. Mountable cassette or cartridge holder. 4,241,859, Cl. 224-312.000.

Eastern Fusecoat Incorporated: *See*—
Voitas, Edward J., 4,241,483, Cl. 29-149.5PM.

Eastman Kodak Company: *See*—
Carver, Bobby C., 4,242,095, Cl. 8-115.600.
Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., 4,242,496, Cl. 528-190.000.
Thomson, Kenneth W., 4,241,986, Cl. 354-193.000.

Eaton Corporation: *See*—
Keene, Derek K., deceased, 4,241,578, Cl. 60-478.000.

Ebauches Electroniques SA: *See*—
Mutrux, Claude, 4,242,745, Cl. 368-73.000.

Eberle, William J., to General Battery Corporation. Apparatus for forming battery straps and intercell connections. 4,241,780, Cl. 164-333.000.

Ebert, Michael: *See*—
Miller, William, 4,241,761, Cl. 137-883.000.

Ebihara, Norio, to Sony Corporation. Noise reduction system for video signals. 4,242,705, Cl. 358-167.000.

Ebitani, Hideaki: *See*—
Kitamura, Kenzo; Ebitani, Hideaki; and Asakura, Masahiro, 4,242,302, Cl. 422-94.000.

Edinger, Egon; and Przybylski, Zdzislaw, to Siemens Aktiengesellschaft. Method and apparatus for separating twisted wires. 4,241,570, Cl. 57-1.0UN.

Edmondson, Harold L. Cutter device. 4,241,502, Cl. 30-241.000.

Edwards, Hugh J. W., to CCL Systems, Limited. Method of applying metal sleeve to concrete reinforcing bar, metal sleeve and swaged connection. 4,241,490, Cl. 29-459.000.

Edwards, John W. Air cleaner and humidifier. 4,242,109, Cl. 55-230.000.

Edwards, Thomas C., to Rovac Corporation, The. Air conditioning system employing dual cycle. 4,241,591, Cl. 62-402.000.

Edwards, William H.: *See*—
Ronning, Albert J.; Edwards, William H.; and Johnson, Dee L., 4,242,162, Cl. 156-212.000.

Effey, Gunter: *See*—
Carduck, Franz-Josef; Drager, Axel; Effey, Gunter; Majmudar, Suresh; and Witthaus, Martin, 4,242,309, Cl. 422-189.000.

Eggen, Hans C.; Halajian, Eugene M.; Danner, Edward L.; and Rogers, Darrell O., to General Motors Corporation. Steering column support. 4,241,937, Cl. 280-777.000.

Ehrenthal Irving; Shieh, Kenneth K.; Scallet, Barrett L.; and Rajpara, Jagdish, to Anheuser-Busch, Incorporated. Method of treatment of flocculated homogenate of microbial cells containing glucose isomerase. 4,242,451, Cl. 435-94.000.

Eiermann, Dankwart, to Borsig GmbH; and Wankel GmbH. Pressure valve, especially for rotary piston compresaors. 4,241,758, Cl. 137-512.150.

Eisermann, Eckehard; and Beckers, Dieter, to Martin & Pagenstecher GmbH. Head or slide plate for a molten-metal slide gate. 4,241,905, Cl. 266-236.000.

Ekman, Bjorn, to Dental AB. Regulating device for pressure fluid actuated apparatus. 4,242,088, Cl. 433-101.000.

El Bouhnini, Larbi; Fitzpatrick, Thomas J.; Harwick, Donald M.; Hoffman, Robert M.; and Knoll, Wayne M., to PPG Industries, Inc.; and United States Gypsum Company. Fiber reinforced composite structural laminate composed of two layers tied to one another by embedded fibers bridging both layers. 4,242,406, Cl. 428-236.000.

Electro-Nucleonics Laboratories, Inc.: *See*—
O'Neill, Sean P., 4,242,322, Cl. 424-1.000.

Elek, Louis F.: *See*—
Rabo, Jule A.; Elek, Louis F.; and Francis, James N., 4,242,103, Cl. 48-197.00R.

Elf Union: *See*—
Hagenbach, Germain; and Maldonado, Paul, 4,242,143, Cl. 106-272.000.
Maldonado, Paul; Dayre, Henri; and Hagenbach, Germain, 4,242,246, Cl. 260-28.5AS.

Eli Lilly and Company: *See*—
Lunn, William H. W., 4,242,509, Cl. 544-21.000.

Elias, Alfonso G. Polishing apparatus. 4,241,471, Cl. 15-250.00R.

Elliott, Denvier D., Jr. Golf training aid. 4,241,922, Cl. 273-189.00A.

Ellis, Vincent S.; and Mieszkis, Kazimierz W., to Imperial Chemical Industries Limited. Production of modified conjugate fibre products. 4,242,382, Cl. 427-379.000.

Elrick, Donald E.; and Gilbert, Harry, to Hercules Incorporated. Composite propellant with surface having improved strain capacity. 4,241,661, Cl. 102-103.000.

Elson, Edward E., to C. R. Bard, Inc. Volume calculator for incentive spirometer. 4,241,739, Cl. 128-725.000.

Emerson Electric Co.: *See*—
Donnelly, Donald E.; and Feero, William B., 4,242,081, Cl. 431-71.000.
Hildebrandt, Eugene F.; and Crow, William D., 4,242,607, Cl. 310-68.00E.

Emerson, Roy J.; Fabris, Hubert J.; Herold, Robert J.; and Duncan, Joe S., to General Tire & Rubber Company, The. Thermoset polyurethane prepared from a polypropylene ether triol obtained using a double metal cyanide complex catalyst, ethylene glycol and tolylene diisocyanate. 4,242,490, Cl. 528-77.000.

Emhart Industries, Inc.: *See*—
Schuder, Maurice E.; and Stafford, Richard W., 4,242,746, Cl. 368-109.000.

Emon, Barbara D.: *See*—
Emon, Donald E.; and Emon, Barbara D., 4,241,725, Cl. 126-428.000.

Emon, Donald E.; and Emon, Barbara D. Solar energy collector. 4,241,725, Cl. 126-428.000.

Endress u. Hauser GmbH u. Co.: *See*—
Rottmar, Werner, 4,242,744, Cl. 367-173.000.

Energy Conversion Devices, Inc.: *See*—
Izu, Masatsugu; and Cannella, Vincent D., 4,242,439, Cl. 430-346.000.

Enertec: *See*—
Metcalf, Eric, 4,242,634, Cl. 324-142.000.

Enicks, James H. Apparatus for manufacturing pad members. 4,[illegible],072, Cl. 425-130.000.

Envirotech Corporation: *See*—
Hendriks, Henry L.; and Hinds, Avery, 4,241,605, Cl. 73-861.940.

Erlandson, Robert K.: *See*—
DuBois, Edmund H.; Erlandson, Robert K.; and Miller, Allan F., 4,241,687, Cl. 440-63.000.

Erwin, Louis R.; and Woodruff, Frank, to Bendix Corporation, The. Control valve for use with variable displacement piston pump. 4,241,753, Cl. 137-116.300.

Eschbach, C. Scott: *See*—
Schilling, Curtis L., Jr.; and Eschbach, C. Scott, 4,242,466, Cl. 521-112.000.

Escher Wyss Limited: *See*—
Biondetti, Mario, 4,241,482, Cl. 29-116.0AD.

Eschner, Axel; and Pohlmann, Erich, to Didier-Werke AG; and Kulmbacher Klimagerate-Werk GmbH & Co. KG. Regenerative heater and process for the operation thereof. 4,241,781, Cl. 165-1.000.

Eshghy, Siavash, to Rockwell International Corporation. Tension control of fasteners. 4,241,488, Cl. 29-407.000.

Estabrooke, John C., to Velcon Filters, Inc. Filter dehydrator. 4,242,206, Cl. 210-489.000.

Estel, Heinz: *See*—
Gratza, Peter; and Estel, Heinz, 4,241,933, Cl. 280-301.000.

Etablissements Bobard Jeune: *See*—
Bobard, Charles E.; Delaunay, Just M.; and Darcy, Raymond M., 4,241,569, Cl. 56-330.000.

Ethyl Corporation: *See*—
Malec, Robert E., 4,242,099, Cl. 44-53.000.

Evani, Syamalarao; and Foster, William A., to Dow Chemical Company, The. Easily disposable non-woven products having high wet strength at acid pH and low wet strength at base pH. 4,242,408, Cl. 428-290.000.

Evans, Walter R.: *See*—
Miller, Harry C.; and Evans, Walter R., 4,241,594, Cl. 70-38.00A.

Exotech, Incorporated: *See*—
Weiser, Sidney, 4,241,996, Cl. 356-124.500.

Extel Corporation: *See*—
Adler, Robert, 4,242,004, Cl. 400-124.000.

Extraction Research & Development, Inc.: *See*—
Torma, Arpad E., 4,242,313, Cl. 423-112.000.

Exxon Research & Engineering Co.: *See*—
Gladrow, Elroy M.; and Winter, William E., 4,242,237, Cl. 252-455.00Z.
Malatesta, Alberto, 4,242,244, Cl. 260-23.70C.
Sansregret, Joseph L., 4,242,374, Cl. 427-76.000.

Eyermann, Philip A.: *See*—
Shishido, Tsuneo; Eyermann, Philip A.; Vick, William L.; and Cramm, Herman W., 4,242,652, Cl. 333-106.000.

Eygermans, Petrus J.: *See*—
Bogerman, Pieter K.; Eygermans, Petrus J.; and van Velzen, Antoon G., 4,242,219, Cl. 252-174.120.

Fabbri, William C.; and Metcalf, Paul T., II, to Keene Corporation. Low level work area lighting system. 4,242,723, Cl. 362-33.000.

Fabcote Manufacturing Proprietary Limited: *See*—
Franceschini, John M., 4,242,500, Cl. 528-492.000.

Fabris, Hubert J.: *See*—
Emerson, Roy J.; Fabris, Hubert J.; Herold, Robert J.; and Duncan, Joe S., 4,242,490, Cl. 528-77.000.

Facet Enterprises, Inc.: *See*—
Miller, Donald L., 4,241,818, Cl. 192-55.000.

Fadeev, Alexandr I.: *See*—
Batjukov, Vladimir I.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Shkhian, Tsolak G.; and Sumatokhin, Vitold A., 4,242,178, Cl. 176-30.000.

Fagundes, John L.; and Taylor, Clyde L. Bank out module builder with unloading mechanism. 4,241,653, Cl. 100-100.000.

Fahrenschon, Kurt, to Braun AG. Analog-digital chronometric display. 4,242,747, Cl. 368-242.000.

Fairchild Camera & Instrument Corporation: *See*—
Biran, Joseph, 4,242,693, Cl. 357-28.000.

Faller, Rudolph A., to Champion International Corporation. Container with multiple compartments. 4,241,863, Cl. 229-27.000.

Fally, Jacques, to Societe Anonyme Dite: Compagnie Generale d'Electricite. Device for producing polycrystalline silicon. 4,242,307, Cl. 422-194.000.

Fancy, Vincent S. Worm trap. 4,241,532, Cl. 43-112.000.

Fannin, Loyd W., to Texas Alkyls, Inc. Aluminum oligomers as polymerization catalysts. 4,242,481, Cl. 526-165.000.

Farber, Sheldon: *See*—
Hoover, Troy E.; Farber, Sheldon; and Becker, William J., 4,242,513, Cl. 544-345.000.

Faris, Bernard L. Apparatus for guiding a hand-held electric drill. 4,242,016, Cl. 408-14.000.

Farkas, Rudolf; Moulin, Michel; and Revillet, Georges, to Hoffmann-La Roche Inc. Spectrophotometer. 4,241,998, Cl. 356-319.000.

Farmer, Larry E.: *See*—
Karsan, Demir I.; Blight, Graham J.; and Farmer, Larry E., 4,242,011, Cl. 405-204.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,242,508, Cl. 542-430.000.

Farr, Glyn P. R., to Girling Limited. Fluid-pressure operated servomotor assemblies for vehicle braking systems. 4,241,583, Cl. 60-555.000.

Fattinger, Volker, to Ciba-Geigy Corporation. Process for separating SO_2 from a current of gas containing the same, and plant for carrying out such process. 4,242,321, Cl. 423-523.000.

Faustini, Franco: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,242,508, Cl. 542-430.000.

Federal-Mogul Corporation: *See*—
Babcock, Bryce W.; Reynolds, Mark P.; and Saluja, Kulbir, 4,241,819, Cl. 192-70.270.

Federspiel, Jean, to Commissariat a l'Energie Atomique. Variable-throttle valve. 4,241,815, Cl. 188-282.000.

Feero, William B.: *See*—
Donnelly, Donald E.; and Feero, William B., 4,242,081, Cl. 431-71.000.

Feess, Erich; Birke, Walter; and Steinbach, Joachim, to Hoechst Aktiengesellschaft. Process for the continuous dyeing of textile webs pre-heated with infra-red or micro-waves. 4,242,091, Cl. 8-444.000.

Feess, Erich; and Gronen, Willy, to Hoechst Aktiengesellschaft. Dyeing preparations and their use for preparing developing dyes. 4,242,094, Cl. 8-666.000.

Fein, Marvin M.: *See*—
Gaylord, Norman G.; Nagler, Meshulam; and Fein, Marvin M., 4,242,482, Cl. 526-192.000.

Feldman, Donald W.: *See—*
Liu, Chi-sheng; Feldman, Donald W.; Williams, Roy K.; and Weaver, Lelland A., 4,242,648, Cl. 331-94.50D.
Felter, John V. Attic fans and apparatus for supporting the drive motors of attic fans. 4,242,055, Cl. 417-362.000.
Feltzin, Joseph; Galvin, Thomas J.; and Kuehn, Erich, to ICI Americas Inc. In-mold coating compositions containing functional group terminated liquid polymers. 4,242,415, Cl. 428-412.000.
Fennell Corporation: *See—*
Hyre, Charles E., 4,242,077, Cl. 431-19.000.
Ferguson, Keith M., to Hewlett-Packard Company. Apparatus for detecting signal precedence. 4,242,637, Cl. 328-110.000.
Ferment, George R.; and Woerner, Douglas C., to GAF Corporation. Flexible sheet-type covering material. 4,242,397, Cl. 428-141.000.
Ferrell, Robert A., to KCL Corporation. Reclosable shipping sack and method. 4,241,865, Cl. 229-62.000.
Ferris, Donald L.; and Ogle, Peter C., to United Technologies Corporation. Adjustable bearing centering means for helicopter rotor elastomeric bearings. 4,242,047, Cl. 416-134.00A.
FIAT Societa per Azioni: *See—*
Quilico, Carlo A.; and Troya, Paolo M., 4,242,593, Cl. 290-53.000.
Finck, Herbert; and Reisinger, Konrad, to Siemens Aktiengesellschaft. Process for testing a data transmission system employing a test loop. 4,242,750, Cl. 371-22.000.
Findeisen, Kurt; Wagner, Kuno; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Process for preparing polyurethanes. 4,242,489, Cl. 528-73.000.
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Idota, Yoshio; and Yamada, Minoru, 4,242,442, Cl. 430-393.000.
Kitagawa, Keishi, 4,242,418, Cl. 428-507.000.
Nakamura, Shigeru; and Shimamura, Isao, 4,242,441, Cl. 430-390.000.
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Sato, Masamichi, 4,242,438, Cl. 430-278.000.
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Fujimoto, Hideaki: *See*—
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Fujiwara, Osamu; Araya, Takeshi; and Udagawa, Tsugio, to Hitachi, Ltd.; and Hitachi Seiko Ltd. Automatic welding line tracing method and apparatus. 4,242,620, Cl. 318-576.000.
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Sakakibara, Hideo; Okegawa, Osamu; Watanabe, Toshiyuki; Fujiwara, Tatsuro; Watanabe, Susumu; Omura, Satoshi; and Matsuda, Tetsuo, 4,242,504, Cl. 536-17.00R.
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Furuse, Akio; and Honma, Yoshihiro, to Kabushiki Kaisha Cosmo Keiki. Pressure setting device. 4,241,750, Cl. 137-101.190.
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Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,242,404, Cl. 428-220.000.
Ferment, George R.; and Woerner, Douglas C., 4,242,397, Cl. 428-141.000.
Gager, Paul F.; and Santana, Manuel R., to Bell Telephone Laboratories, Incorporated. Optical communication cable with means for controlling coupling between cable jacket and strength members. 4,241,979, Cl. 350-96.230.
Gagnon, Donald W.; and Tillman, James J., to Owens-Illinois, Inc. Organopolysiloxane resins formed with catalysts of formic acid and hydrocarbyl substituted ammonium hydroxide. 4,242,250, Cl. 260-33.4SB.
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Galvin, Thomas J.: *See*—
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Gardocki, Joseph F., to McNeilab, Inc. Analgesic potentiation. 4,242,353, Cl. 424-274.000.
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Garrett Corporation, The: *See*—
McCarty, Frederick B.; and Silver, Alexander, 4,242,610, Cl. 310-156.000.
Garver, Richard F.; and Stevanovich, Srbo M., to B. F. Goodrich Company, The. Shape of cut for semicure butyl rubber bag. 4,242,070, Cl. 425-28.00B.
Gasc, Jean-Claude; and Rettien, Claude, to Roussel Uclaf. Aminoglycosides and method of use. 4,242,331, Cl. 424-180.000.
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Gault, Robert L. Patient monitoring system and switch. 4,242,672, Cl. 340-573.000.
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Gee, Kenneth H.; and Kreiger, John W., to Bethlehem Steel Corporation. Method for treating granulated blast furnace slag. 4,242,142, Cl. 106-97.000.
Gehle, Richard W., to Rockwell International Corporation. Method of assembly of microwave integrated circuits having a structurally continuous ground plane. 4,242,157, Cl. 156-64.000.
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Abolins, Visvaldis, 4,242,254, Cl. 260-40.00R.
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Brown, Trevor J., 4,241,954, Cl. 301-37.00R.
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GenRad, Inc.: *See*—
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Henckels, Lutz P.; Haas, Rene M.; and Levin, Alan, III, 4,242,751, Cl. 371-26.000.

Georg, Werner; Merten, Gerhard; and Langenberg, Helmut, to Gewerkschaft Eisenhutte Westfalia. Conveyors for use in mineral mining installations. 4,241,824, Cl. 198-745.000.

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Grondahl, Clayton M.; and Germain, Malcolm R., 4,242,045, Cl. 416-92.000.

Gertz, David C. Gas turbine engine. 4,241,576, Cl. 60-39.340.

Geurtsen, Alfonsus A., to Machinefabriek Geurtsen Deventer B.V. Apparatus for separating mixtures of liquids of different specific gravities, etc. 4,242,209, Cl. 210-519.000.

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Giesbert, Frank; and Kuhnert, Roland, to Heraeus Christ GmbH. Method of gently controlling braking of a centrifuge, and braking system. 4,241,866, Cl. 233-24.000.

Gilbert, Harry: *See*—
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Gildemeister-Devlieg System-Werkzeuge GmbH: *See*—
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Gilleland, Randall C.: *See*—
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Gilmer, John L.; and Rizzo, Joseph F., to Bell Telephone Laboratories, Incorporated. Digital operate/release timer. 4,242,636, Cl. 328-63.000.

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Hulten, Bengt H.; Skarfelt, Hans T.; and Gjertz, Uno L., 4,242,161, Cl. 156-197.000.

Gladrow, Elroy M.; and Winter, William E., to Exxon Research & Engineering Co. Hydrocarbon cracking catalyst and process utilizing the same. 4,242,237, Cl. 252-455.00Z.

Glaser, Helmut; and Schick, Ludwig, to Siemens Aktiengesellschaft. Circuit for monitoring the square of the RMS value of a periodic signal. 4,242,638, Cl. 328-144.000.

Glatthorn, Raymond H., to Westinghouse Electric Corp. Automatic plug welding apparatus. 4,242,563, Cl. 219-125.110.

Gloanec, Maurice, to Thomson-CSF. Gunn effect shift register. 4,242,597, Cl. 307-221.00B.

Globus, Richard D.: *See*—
Globus, Ronald P.; Globus, Richard D.; and Globus, Stephen E., 4,241,985, Cl. 354-99.000.

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Globus, Stephen E.: *See*—
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Glover, Richard D. Method of sublimatic printing on sheet structures. 4,242,092, Cl. 8-472.000.

Godsay, Madhu P.: *See*—
Costa, Eugene, Jr.; and Godsay, Madhu P., 4,242,411, Cl. 428-369.000.

Goethals, Rafael A. J.: *See*—
Van Hijfte, Willy H. P.; and Goethals, Rafael A. J., 4,241,692, Cl. 118-303.000.

Going, Walter S., III, to Hughes Tool Company. Protected cutter mounting for drill bits. 4,241,799, Cl. 175-361.000.

Golata, John H.; and Kinstler, John R., to Motor Wheel Corporation. Wheel disc manufacturing. 4,241,597, Cl. 72-327.000.

Goldberg, Norman N., to Ziff-Davis Publishing Company. Apparatus for optimizing camera image surface to image receiving surface. 4,241,987, Cl. 354-195.000.

Golias, Tipton; Butts, Gene A.; and Swift, Robert A., to Helena Laboratories Corporation. Single scan microprocessor-controlled densitometer. 4,242,730, Cl. 364-416.000.

Gomez, Jose J., to Thomas & Betts Corporation. Connector with ejector-retainer means. 4,241,966, Cl. 339-45.00M.

Goodrich, Edward W.: *See*—
Lewis, Raymond H., Jr.; Goodrich, Edward W.; and Kline, Dale W., 4,242,713, Cl. 361-86.000.

Goodyear Tire & Rubber Company, The: *See*—
Dean, Paul R., II; and Kuczkowski, Joseph A., 4,242,224, Cl. 252-402.000.
Lal, Joginder, 4,242,471, Cl. 525-333.000.

Goossens, John C.; and Olson, Daniel R., to General Electric Company. Method of providing a polycarbonate article with a uniform and durable silica filled organopolysiloxane coating. 4,242,381, Cl. 427-387.000.

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Gorgenyi, Peter: *See*—
Antal, Sandor; Bartha, Zoltan; Gorgenyi, Peter; Meitzen, Nandor; and Arvai, Mihaly, 4,241,763, Cl. 138-127.000.

Goring, Joachim: *See*—
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,242,345, Cl. 424-253.000.

Gorzegno, Walter P., to Foster Wheeler Energy Corporation. Method of operating a vapor generating system having integral separators and a constant pressure furnace circuitry. 4,241,585, Cl. 60-646.000.

Goto, Shiro: *See*—
Fujii, Masaki; Goto, Shiro; and Sakurai, Hideo, 4,242,229, Cl. 252-429.00B.

Gould, Wayne P.; and Chouinard, Raymond J. Power take-off. 4,241,614, Cl. 74-15.630.

Grade, Reinhardt: *See*—
Berrer, Dagmar; Lorenz, Joachim; and Grade, Reinhardt, 4,242,119, Cl. 71-67.000.

Graham, Kenneth A., to Chrysler Corporation. Method for assembling a fuel pump and motor. 4,241,484, Cl. 29-156.40R.

Grampovnik, David J.: *See*—
Lartey, Paul A.; and Grampovnik, David J., 4,242,503, Cl. 536-17.00R.

Grant, Walter W. Digital display tape measure with photoelectric sensing of tape displacement. 4,242,574, Cl. 235-92.0DN.

Graphic Calculator Company: *See*—
Wolf, Robert H.; and Dugas, Madeleine L., 4,241,867, Cl. 235-85.00R.

Gras, Rainer; Obendorf, Johann; and Wolf, Elmar, to Chemische Werke Huls AG. Storage-stable baking lacquers prepared from polyisocyanates blocked with cyclic amidines. 4,242,248, Cl. 260-31.20N.

Gratza, Peter; and Estel, Heinz, to Bayerische Motoren Werke Aktiengesellschaft. Side support for motorcycle. 4,241,933, Cl. 280-301.000.

Green, Sidney J.; Shipman, Floyd H.; and Van Kempen, Carl J. H. B., to Terra Tek, Inc. Active drill stabilizer assembly. 4,241,796, Cl. 175-24.000.

Greeson, James C., Jr.: *See*—
Beidl, John R.; Criscimagna, Tony N.; and Greeson, James C., Jr., 4,242,680, Cl. 340-771.000.

Greff, Richard; Wolf, Ludwig, Jr.; Munsch, John; and Kinney, Layton C., to Baxter Travenol Laboratories, Inc. Sterile connection apparatus. 4,242,310, Cl. 422-300.000.

Gregson, Donald L., to Dracon Industries. Blade storage and selectable force impact termination tool. 4,241,496, Cl. 29-751.000.

Greuter, Hans: *See*—
Martin, Pierre; Greuter, Hans; Steiner, Eginhard; and Bellus, Daniel, 4,242,278, Cl. 568-341.000.

Grigsby, Charles O.; and Grigsby, David R. Process for manufacturing cheese. 4,242,362, Cl. 426-40.000.

Grigsby, David R.: *See*—
Grigsby, Charles O.; and Grigsby, David R., 4,242,362, Cl. 426-40.000.
Grimm, Bernard J.; and Dossett, Richard A., to General Electric Company. Household refrigerator air flow control assembly. 4,241,589, Cl. 62-265.000.
Grondahl, Clayton M.; and Germain, Malcolm R., to General Electric Company. Trap seal for open circuit liquid cooled turbines. 4,242,045, Cl. 416-92.000.
Gronen, Willy: *See*—
Feesa, Erich; and Gronen, Willy, 4,242,094, Cl. 8-666.000.
Gronwold, Gunther E.: *See*—
Larsson, Ake L.; Gronwold, Gunther E.; and Corris, Derek A., 4,241,534, Cl. 46-206.000.
Grosch, Gottlieb W. Concrete wall casing with centralizers embedded therein. 4,241,789, Cl. 166-241.000.
Gross, Thomas A. O., to Jet Spray Cooler, Inc. AC Motor drive. 4,242,626, Cl. 318-772.000.
Grosse, Jurgen, to Hoechst Aktiengesellschaft. Production of amine salts of acid O,S-dialkylthiophosphoric acid. 4,242,511, Cl. 544-110.000.
Grubb, Frederick H., Jr., to Acme Visible Records, Inc. Single open frame for the rotor of a rotary storage cabinet. 4,241,964, Cl. 312-305.000.
GTE Products Corporation: *See*—
deVos, Hendrik A. J.; and Labouliere, Elzear R., 4,242,727, Cl. 362-346.000.
D'Silva, Thomas L., 4,242,134, Cl. 75-173.00C.
GTE Sylvania Wiring Devices, Inc.: *See*—
Tibolla, Julius F., 4,242,552, Cl. 200-339.000.
Guerin, Yves: *See*—
Oudet, Claude; and Guerin, Yves, 4,242,623, Cl. 318-696.000.
Guidotti, Ronald A., to United States of America, Interior. Removal of sodium sulfate from a sulfate-containing sodium chloride solution in a process for separating zirconium and hafnium. 4,242,312, Cl. 423-73.000.
Guilino, Ernst: *See*—
Lubbers, Dietrich W.; and Guilino, Ernst, 4,241,738, Cl. 128-666.000.
Guillaume, Emile A. H., to Zelacolor Systems Establishment. Mount for originals in photographic devices. 4,241,993, Cl. 355-75 000.
Gurske, William A., to Beckman Instruments, Inc. Polysaccharide ester membrane clearing process. 4,242,298, Cl. 264-233.000.
Gurtner, Peter: *See*—
Wunderlin, Max; and Gurtner, Peter, 4,242,568, Cl. 219-296.000.
Gushima, Hiroshi: *See*—
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.
Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*—
Link, Heinz; Schupp, Heribert; and Lendla, Heinz, 4,241,762, Cl. 138-105.000.
H. E. Schweitzer AG: *See*—
Schweitzer, Hans E., 4,242,544, Cl. 200-5.00E.
Schweitzer, Hans E., 4,242,545, Cl. 200-5.00R.
Haas, Rene M.: *See*—
Henckels, Lutz P.; Haas, Rene M.; and Levin, Alan, III, 4,242,751, Cl. 371-26.000.
Habegger, Willy: *See*—
Lauber, Ernst, 4,241,803, Cl. 180-8.00R.
Habu, Teiji; Ishihara, Masao; Terada, Sadatugu; Sakamoto, Eiichi; and Yamada, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Process for the preparation of light-sensitive silver halide photographic material. 4,242,444, Cl. 430-510.000.
Hada, Hiroshi, to Fuji Photo Film Co., Ltd. Optical-charging type half-cell, and photochemical battery using the same. 4,242,423, Cl. 429-111.000.
Haga, Hachiro: *See*—
Tsuruta, Mitsuo; and Haga, Hachiro, 4,241,646, Cl. 98-115.0SB.
Hagenbach, Germain; and Maldonado, Paul, to Elf Union. Process for improving the properties of bituminous products and an improved cast asphalt. 4,242,143, Cl. 106-272.000.
Hagenbach, Germain: *See*—
Maldonado, Paul; Dayre, Henri; and Hagenbach, Germain, 4,242,246, Cl. 260-28.5AS.
Hagenlocher, Arno K.: *See*—
Kuehnle, Manfred R.; and Hagenlocher, Arno K., 4,242,433, Cl. 430-67.000.
Hagiwara, Yoshiaki, to Sony Corporation. Charge transfer device which has a pair of straight portions joined by a direction changing portion. 4,242,692, Cl. 357-24.000.
Halajian, Eugene M.: *See*—
Eggen, Hans C.; Halajian, Eugene M.; Danner, Edward L.; and Rogers, Darrell O., 4,241,937, Cl. 280-777.000.
Halasa, Adel F.: *See*—
Hergenrother, William L.; and Halasa, Adel F., 4,242,491, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,242,492, Cl. 528-168.000.
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Hergenrother, William L.; and Halasa, Adel F., 4,242,495, Cl. 528-168.000.
Halasz, Joseph; and Ito, Rokuzo, to Canada Wire and Cable Limited. Reel clamp for a cradle assembly. 4,241,573, Cl. 57-127.700.
Halcon Research & Development Corporation: *See*—
Moy, David, 4,242,520, Cl. 560-24.000.
Hall, Charles M.; and Johnson, Herbert G., to Upjohn Company, The. Quinoxalinones useful for treating atopic eczema and urticaria. 4,242,342, Cl. 424-250.000.
Hall, Frederick M. Opener device for sealed cans. 4,241,626, Cl. 81-3.46R.
Hall, Henry P., to GenRad, Inc. Front-end circuit apparatus for impedance measurements and the like. 4,242,631, Cl. 324-62.000.
Hall, James H., III; and Attaway, Julian J., to MM Systems Corporation. Conjoint facia, flashing and water dam. 4,241,549, Cl. 52-60.000.
Hall, Kenneth F.: *See*—
Hinch, Peter G.; Hall, Kenneth F.; and Chambers, George, 4,241,680, Cl. 112-275.000.
Hall, Wilbur S.; and Leister, Harry M., to Amchem Products, Inc. Acid inhibitor treatment of substrate prior to autodeposition. 4,242,379, Cl. 427-327.000.
Halterman, Francis J., Jr., to General Motors Corporation. Angle dozer assembly. 4,241,794, Cl. 172-804.000.
Hamada, Masa: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,242,453, Cl. 435-123.000.
Hamaguchi, Yasunori: *See*—
Nemoto, Akira; and Hamaguchi, Yasunori, 4,241,928, Cl. 277-212.0FB.
Hamm, Philip C.; and Olin, John F., to Monsanto Company. Herbicidal meta-bifunctional benzenes. 4,242,122, Cl. 71-100.000.
Hammann, Ingeborg: *See*—
Fuchs, Rainer A.; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,242,357, Cl. 424-282.000.
Hammett, Roy: *See*—
Pauls, James D.; Hammett, Roy; and Blake, William S., 4,241,853, Cl. 222-207.000.
Hampton, Joseph. Skate blade sharpener. 4,241,544, Cl. 51-33.00R.
Han, Benjamin C. P.; and Weldy, Floyd P., to Bendix Corporation, The. Aircraft brake thermal sensor. 4,241,603, Cl. 73-129.000.
Han, Chang D.; and Morrow, Vance, to Seismograph Service Corporation. Rheometer. 4,241,602, Cl. 73-56.000.
Handa, Mitsuaki: *See*—
Sugawara, Yutaka; Yamamoto, Akihiro; Handa, Mitsuaki; Usami, Hiroko; and Ogawa, Haruki, 4,242,326, Cl. 424-116.000.
Handelsman, Steven K.; and Pruchno, Albert A., to Ford Motor Company. Carburetor idle mixture screw enclosure assembly. 4,242,290, Cl. 261-41.00D.
Handschin, Gert: *See*—
Varsanyi, Denis; and Handschin, Gert, 4,242,333, Cl. 424-225.000.
Hansen, Robert E.: *See*—
Cabados, Rick H.; and Hansen, Robert E., 4,241,741, Cl. 131-173.000.
Hanson, Joseph B., to Standard Oil Company (Indiana). Mannich additives modified by dihertiary alkyl phenol. 4,242,212, Cl. 252-51.50R.
Hara, Hiroshi; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Method of stabilizing organic substrate materials against light. 4,242,429, Cl. 430-17.000.
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Method for stabilizing organic substrate materials including photographic dye images against light. 4,242,430, Cl. 430-17.000.
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Method for stabilizing organic substrate materials including photographic dye images to light and a photographic material so stabilized. 4,242,431, Cl. 430-17.000.
Hara, Shigeyoshi: *See*—
Kawaguchi, Takeyuki; Taketani, Yutaka; Minematsu, Hiroyoshi; Sasaki, Noriaki; Hayashi, Yuzuru; and Hara, Shigeyoshi, 4,242,208, Cl. 210-500.200.
Hara, Shinichi: *See*—
Suzuki, Masayuki; Onuma, Nobuo; Ishizuka, Fumihiko; Hara, Shinichi; Osawa, Akira; and Fukuzawa, Akira, 4,242,177, Cl. 162-17.000.
Hard, Robert A., to Occidental Research Corporation. Recovery of magnesia from oil shale. 4,241,951, Cl. 299-2.000.
Hardesty, Edwin C., to Western Electric Company, Inc. Multi-outlet adapter for modular telephone cords. 4,241,974, Cl. 339-154.00A.
Hardy, Charles T., to Republic Packaging Company. Means for containing electrostatic sensitive electronic components. 4,241,829, Cl. 206-328.000.
Harms, Wolfgang; von Oertzen, Klaus; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Anthraquinone-azo reactive dyestuffs. 4,242,259, Cl. 260-153.000.
Harney, Marilyn J.: *See*—
O'Boyle, Matthew; Icore, Bernard; and Harney, Marilyn J., 4,242,425, Cl. 429-181.000.
Harold, Donald M.; and Ufken, Gregory A., to Donaldson Company, Inc. Air cleaner assembly. 4,242,115, Cl. 55-347.000.
Harper, Patrick D.: *See*—
Weber, Robert E; and Harper, Patrick D., 4,242,729, Cl. 364-431.000.
Harrelson Rubber Company: *See*—
DeHaven, William M., 4,242,169, Cl. 156-394.000.
Harrer, Paul H., to Allis-Chalmers Corporation. Air cut-off pad for an air planter with seed discharge feature. 4,241,849, Cl. 221-266.000.

Harrington, Duane E.; and Robinson, Merritt A., to Harrington, Duane E. Paper wiring transport apparatus and process. 4,242,170, Cl. 156-438.000.
Harris Corporation: *See—*
Washburn, Clyde, Jr., 4,242,649, Cl. 332-18.000.
Harris, Len A.: *See—*
Baney, Ronald H.; and Harris, Len A., 4,242,416, Cl. 428-412.000.
Harris, Norman; and Shevels, Thomas F., to Davy International (Oil & Chemicals) Limited. Process for recovery of rhodium values and triphenylphosphine from rhodium catalyzed hydroformylation medium. 4,242,284, Cl. 568-454.000.
Harshaw Chemical Company, The: *See—*
Malak, Thomas P., 4,242,181, Cl. 204-52.00R.
Hartford, Thomas W., to Bendix Corporation, The. Input/output electronic for microprocessor-based engine control system. 4,242,728, Cl. 364-431.000.
Hartley, Donald J.: *See—*
Matucheski, Joseph V.; Yee, Clifford S. L.; Spellman, Michael T.; Hartley, Donald J.; and Barton, William D., 4,242,046, Cl. 416-132.00A.
Hartley, E. Dale. Double diaphragm pump. 4,242,061, Cl. 417-536.000.
Hartman, Adrian R.: *See—*
Berthold, Joseph E.; Hartman, Adrian R.; and Shackle, Peter W., 4,242,697, Cl. 357-49.000.
Hartmann, William F., to Rothschild, Gerald W. Wheelchair steering apparatus. 4,241,932, Cl. 280-265.000.
Hartvig, Ole K. Sign post. 4,241,530, Cl. 40-607.000.
Harvey Hubbell, Incorporated: *See—*
D'Amato, Michael J.; and Jaconette, Frank C., 4,241,969, Cl. 339-88.00R.
Harville, Ronald W. Orbitally rotating piston engine. 4,242,591, Cl. 290-1.00R.
Harwick, Donald M.: *See—*
El Bouhnini, Larbi; Fitzpatrick, Thomas J.; Harwick, Donald M.; Hoffman, Robert M.; and Knoll, Wayne M., 4,242,406, Cl. 428-236.000.
Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Antibacterial and antifungal composition. 4,242,336, Cl. 424-246.000.
Hasegawa, Masayasu; Nishikawa, Hideo; and Kotani, Yasuo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Antibacterial and antifungal composition. 4,242,356, Cl. 424-279.000.
Hasegawa, Yoshio: *See—*
Yajima, Seishi; Okamura, Kiyohito; Shishido, Toetsu; and Hasegawa, Yoshio, 4,242,487, Cl. 528-25.000.
Hashiba, Honoh: *See—*
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Hashimoto Corporation Kabushiki Kaisha: *See—*
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Hashimoto, Kazuo, to Hashimoto Corporation Kabushiki Kaisha. Telephone information displaying device. 4,242,539, Cl. 179-5.500.
Hashimoto, Kazuo, to Iida Sankyo Kabushiki Kaisha. Periodical switching device capable of adjusting the operation time. 4,242,547, Cl. 200-38.00R.
Hashimoto, Kiyoharu: *See—*
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Hashimoto, Otokuma: *See—*
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Haskins, Steve W.: *See—*
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Hasselfors Stainless AB: *See—*
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Hastings, Donald R., to Nordson Corporation. Electrostatic spray gun. 4,241,880, Cl. 239-691.000.
Hattori, Minoru: *See—*
Kato, Nobukatu; Takase, Tsutomu; Morimoto, Yoshio; Yuasa, Teruo; and Hattori, Minoru, 4,242,528, Cl. 568-781.000.
Hauni-Werke Korber & Co. KG: *See—*
Wochnowski, Waldemar; and Hohm, Reinhard, 4,241,515, Cl. 34-28.000.
Hawkins, Alan F.; Lewis, Terence; and Jones, Ian, to Imperial Chemical Industries Limited. Method of antagonizing herbicides on soyabean and cotton. 4,242,121, Cl. 71-93.000.
Haworth Mfg., Inc.: *See—*
Wilson, Harold R.; and Tillmann, Ditmar K., 4,241,965, Cl. 339-4.000.
Hay, Louis E.: *See—*
Mercer, Roger W.; and Hay, Louis E., 4,242,292, Cl. 264-16.000.
Hayashi, Hideo: *See—*
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Hayashi, Yuzuru: *See—*
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Hayes, Calvin L. Height-adjustable hoist. 4,241,838, Cl. 212-255.000.
Healy, Donald H. Automobile tire riding vehicle. 4,241,931, Cl. 280-205.000.
Hearnshaw, David, to Dulmison (Australia) Pty. Ltd. Spacer damper. 4,242,537, Cl. 174-42.000.
Hedberg, Arthur S., to Wells Manufacturing Company. Process for manufacture of valve seat. 4,241,492, Cl. 29-527.600.
Hedger, John H. Reciprocating engine with improved main bearing. 4,241,640, Cl. 91-186.000.
Hedges, Charles V.: *See—*
Mark, Victor; and Hedges, Charles V., 4,242,527, Cl. 568-724.000.
Hedges, Rhey W., to Parker, Louis W. Energy economizer for polyphase induction motors. 4,242,625, Cl. 318-729.000.
Hedinger, Alfred: *See—*
Muller, Hans-Rudolf; Kundig, Werner; and Hedinger, Alfred, 4,242,145, Cl. 127-46.00R.
Hegarty, William P.: *See—*
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Heijnemans, Werner A. L.; Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., to U.S. Philips Corporation. Deflection unit for color television display tubes. 4,242,612, Cl. 313-421.000.
Hein, Lehmann Aktiengesellschaft: *See—*
Laddach, Hans; and Oertel, Werner, 4,241,767, Cl. 139-443.000.
Heinzer, Hans: *See—*
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Helena Laboratories Corporation: *See—*
Golias, Tipton; Butts, Gene A.; and Swift, Robert A., 4,242,730, Cl. 364-416.000.
Helfet, Arthur J. Knee support. 4,241,730, Cl. 128-80.00C.
Helinski, Edward F., to International Business Machines Corporation. Magnetic actuator using modulated flux. 4,242,658, Cl. 335-237.000.
Hellman, Erik R., to AB Asea-Atom. Apparatus for heat treating elongated sheets. 4,241,905, Cl. 266-109.000.
Hem, Stanley L.; and White, Joe L., to Purdue Research Foundation. Process and compositions. 4,242,328, Cl. 424-157.000.
Hempstead, Robert D.; and Money, James B., to International Business Machines Corporation. Thin film head having negative magnetostriction. 4,242,710, Cl. 360-113.000.
Henckels, Lutz P.; Haas, Rene M.; and Levin, Alan, III, to GenRad, Inc. Automatic fault-probing method and apparatus for checking electrical circuits and the like. 4,242,751, Cl. 371-26.000.
Hendriks, Henry L.; and Hinds, Avery, to Envirotech Corporation. Flowmeter with magnetic coupling. 4,241,605, Cl. 73-861.940.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Carduck, Franz-Josef; Drager, Axel; Effey, Gunter; Majmudar, Suresh; and Witthaus, Martin, 4,242,309, Cl. 422-189.000.
Henoch, Bengt T.; and Berglind, Eilert, to Stifelsen Institutet for Mikrovagsteknik Vid Tekniska Hogskolan i Stockholm. Device for registration of objects. 4,242,661, Cl. 340-23.000.
Hentschel, Georg, to SKF Industrial Trading & Development Co. B.V. Slide bushing formed of flat slip steel band with antifriction coating. 4,241,960, Cl. 308-237.00R.
Henzl, Jindrich: *See—*
Foltyn, Jan; Henzl, Jindrich; Rotrekl, Otto; and Kuda, Vladimir, 4,241,764, Cl. 139-1.00R.
Heppner, Klaus-Dieter; and Schuster, Hans-Joachim, to Siemens Aktiengesellschaft. Ammonia free palladium electroplating bath using aminoacetic acid. 4,242,180, Cl. 204-43.00N.
Heraeus Christ GmbH: *See—*
Giesbert, Frank; and Kuhnert, Roland, 4,241,866, Cl. 233-24.000.
Hercules Incorporated: *See—*
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Hergenrother, Rudolf C. Nighttime wind direction and speed indicator. 4,241,604, Cl. 73-189.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing substituents of acrylate functionality. 4,242,491, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing substituted or unsubstituted nitrophenoxy substituents. 4,242,492, Cl. 528-168.000.
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Herkert, Hans, to Siemens Aktiengesellschaft. Circuit arrangement for coding or decoding of binary data. 4,242,752, Cl. 371-37.000.
Herold, Robert J.: *See—*
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Herzig, John. Mortar trough. 4,241,470, Cl. 15-235.400.
Herzog, Walter. Cart theft prevention system. 4,242,668, Cl. 340-539.000.

Hester, Wesley W.: *See*—
Snellman, Donald L.; Lewis, Barry J.; Saunders, Arthur G.; and Hester, Wesley W., 4,242,174, Cl. 156-563.000.
Hetmanski, James R.: *See*—
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Heuga Australia Production Pty. Ltd.: *See*—
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Heyneman, Guido; Vandenbossche, Christiaan; and Thieme, Roland, to Siemens Aktiengesellschaft. Automated reaction housing for use in quantitative analysis. 4,242,301, Cl. 422-68.000.
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Hibbel, Josef; Kessen, Gunther; and Meis, Josef, to Ruhrchemie Aktiengesellschaft. Process for continuously producing oxygen-containing compounds. 4,242,283, Cl. 568-451.000.
Higa, Teikichi: *See*—
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,241,623, Cl. 74-765.000.
Higuchi, Noboru; and Futamura, Shoji, to NGK Insulators, Ltd.; and Institute of Technology Precision Electrical Discharge Works. Extrusion dies for extruding honeycomb structural bodies. 4,242,075, Cl. 425-462.000.
Hildebrandt, Eugene F.; and Crow, William D., to Emerson Electric Co. Centrifugal actuator for motor starting switch. 4,242,607, Cl. 310-68.00E.
Hilding, Arthur W. Ashtray to control burning rate of cigarette. 4,241,742, Cl. 131-235.00R.
Hill, Richard F.: *See*—
Weber, Willis W.; Hill, Richard F.; and Weeks, Thomas J., Jr., 4,242,271, Cl. 260-448.0AD.
Hill, Richard N., to W. R. Grace & Co. Reduction of magnesium and other cations in phosphoric acid. 4,242,198, Cl. 423-321.00R.
Hinch, Peter G.; Hall, Kenneth F.; and Chambers, George, to Newroyd Limited. Device for stopping a needle at a predetermined position. 4,241,680, Cl. 112-275.000.
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Hiraki, Hideaki: *See*—
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Hirs, Gene. Traveling belt filter. 4,242,205, Cl. 210-400.000.
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Koike, Norio; and Kubo, Masaharu, 4,242,694, Cl. 357-30.000.
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Hoechst Aktiengesellschaft: *See*—
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Hoffmann-La Roche Inc.: *See*—
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Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, to Snow Brand Milk Products Co., Ltd. Method of hydrolyzing sugar, protein or the like and apparatus therefor. 4,242,450, Cl. 435-69.000.
Honeywell Inc.: *See*—
Dreiling, James A., 4,242,708, Cl. 360-74.500.
Tabei, Tohru, 4,242,080, Cl. 431-54.000.
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Hoover, Troy E.; Farber, Sheldon; and Becker, William J., to Appleton Papers Inc. Lactone compounds containing a heterocyclic radical. 4,242,513, Cl. 544-345.000.
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Battey, Paul K.; Bergfeld, Manfred; and Hope, Peter, 4,242,523, Cl. 560-48.000.
Hopfe, Harold H.; Mosher, Robert H.; and Sedgeley, Lawrence R., to Monsanto Company. Doctor blade holder. 4,241,691, Cl. 118-126.000.
Hopp, Harold P. Method of installing captive type spark plug gasket with low profile locking tabs. 4,241,491, Cl. 29-511.000.
Hori, Ryoichi; and Itoh, Kiyoo, to Hitachi, Ltd. Memory system with a stabilized sense amplifier. 4,242,739, Cl. 365-203.000.
Hornstein, Robert L. Apparatus for converting a loader bucket to a pallet loader. 4,242,035, Cl. 414-724.000.
Hoshi, Toshiharu: *See*—
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Hoshino, Takashi; Imaizumi, Setsuko; and Tomita, Seisuke, to Bridgestone Tire Company Limited. Vulcanizable rubber composition improved in sulfur blooming with metal alkylxanthate. 4,242,472, Cl. 525-343.000.
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Houdard, Jean P., to Le Materiel Telephonique. Methods and apparatus for demodulating a differentially phase-modulated signal. 4,242,641, Cl. 329-126.000.
Howell, Charles I., to World Carpets, Inc. Carpet web having patterned adhesive segments on the backing thereof and method of manufacture of the same. 4,242,389, Cl. 428-40.000.
Hoyer, Ernst: *See*—
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Huber, Guntram; Klie, Wolfgang; Fischer, Wolfgang; Riechers, Daniel; and Hutai, Hubert, to Daimler-Benz Aktiengesellschaft. Motor vehicle bumper. 4,241,945, Cl. 293-120.000.
Hubrecht, Gerard; and Mechain, Gerard, to Quiri. Self-locking shock absorber with volume compensation. 4,241,816, Cl. 188-298.000.
Huebner, Charles F., to Ciba-Geigy Corporation. Hypotensive indolylalkylpiperidyl guanidines and isoureas. 4,242,347, Cl. 424-267.000.

Huffman, Charles E.; McGuire, Robert J.; and Welch, Herbert E., to Rockwell International Corporation. Multiline switching protection apparatus. 4,242,756, Cl. 455-8.000.
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Hughes, Nathaniel, to Hughes Sciences Group, Inc. Stable vortex generating device. 4,241,877, Cl. 239-405.000.
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Hull, John R., to Iowa State University Research Foundation, Inc. Method and means of preventing heat convection in a solar pond. 4,241,724, Cl. 126-415.000.
Hulten, Bengt H.; Skarfelt, Hans T.; and Gjertz, Uno L., to Munksjo Aktiebolag. Method and a machine for producing cellular latticework. 4,242,161, Cl. 156-197.000.
Hunt, Gerald P.: *See—*
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Hunts, Barney D., to Singer Company, The. High density proximity switch arrangement. 4,242,667, Cl. 340-365.00R.
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Hussain, Anwar A.; Truelove, James E.; and Kostenbauder, Harry B., to University of Kentucky Research Foundation, The. Derivative of aspirin. 4,242,330, Cl. 424-180.000.
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Hutcheon, Keith F.; and Cordingley, Laurence A., to TI Raleigh Industries Limited. Endless bands. 4,242,385, Cl. 428-31.000.
Huther, Werner; Schweitzer, Klaus; and Rossmann, Axel, to Motoren- und Turbinen-Union Munchen GmbH. Method for encapsulating a molded ceramic member. 4,242,294, Cl. 264-62.000.
Huzii, Norihito, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting toner concentration. 4,241,696, Cl. 118-691.000.
Hydrodynamic Energy Systems Corporation: *See—*
Borgren, Peter M., 4,241,579, Cl. 60-504.000.
Hynes, William M., to Miller Fluid Power Corporation. Compressed gas drying apparatus. 4,242,110, Cl. 55-269.000.
Hyre, Charles E., to Fennell Corporation. Fluid bed furnace and fuel supply system for use therein. 4,242,077, Cl. 431-19.000.
I & I Sling Company, Inc.: *See—*
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Iannarone, Ronald C., to Singer Company, The. Carrying handle for a sewing machine. 4,241,472, Cl. 16-115.000.
Ibaraki, Howard, to Orion Industries, Inc. Adjustable oil funnel. 4,241,851, Cl. 222-83.500.
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Idota, Yoshio; and Yamada, Minoru, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic material. 4,242,442, Cl. 430-393.000.
Igoe, Robert S., to Merck & Co., Inc. Milk shake and soft serve frozen dessert stabilizer. 4,242,367, Cl. 426-573.000.
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Ilk, Emil. Holding device for cup-shaped glassware articles in a glass processing machine. 4,241,546, Cl. 51-227.00R.
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Andrew, Malcolm S.; and Backhouse, Alan J., 4,242,384, Cl. 427-421.000.
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Yellin, Tobias O.; and Mant, Derrick M., 4,242,351, Cl. 424-272.000.
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Infantino, Dick S., to Kool Foam Products, Inc. Decorative skirting panel system. 4,241,554, Cl. 52-314.000.
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Ingram, Charles E., to Four Star Corporation. Article carrier stanchion. 4,241,860, Cl. 224-316.000.
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Institute of Technology Precision Electrical Discharge Works: *See—*
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International Business Machines Corporation: *See—*
Beidl, John R.; Criscimagna, Tony N.; and Greeson, James C., Jr., 4,242,680, Cl. 340-771.000.
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International Paper Company: *See—*
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International Standard Electric Corporation: *See—*
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Irvin, Robert A., to Semicon, Inc. Method and apparatus for testing axial-lead components. 4,242,632, Cl. 324-73.00R.
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Ishida, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of an internal combustion engine. 4,241,704, Cl. 123-432.000.
Ishigaki, Yasuhiro; and Sugiyama, Toshio, to Hitachi, Ltd. Motor using Hall effect elements. 4,242,608, Cl. 310-68.00R.
Ishigaki, Yoshio: *See*—
Yoshida, Susumu; Ishigaki, Yoshio; and Nagai, Tamiji, 4,242,714, Cl. 361-152.000.
Ishihara, Masao: *See*—
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Ishizuka, Fumihiko: *See*—
Suzuki, Masayuki; Onuma, Nobuo; Ishizuka, Fumihiko; Hara, Shinichi; Osawa, Akira; and Fukuzawa, Akira, 4,242,177, Cl. 162-17.000.
Ishizuka, Hiroshi. Process for producing metallic zirconium. 4,242,136, Cl. 75-84.500.
Ishizuka, Masaaki: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,242,453, Cl. 435-123.000.
Ishizuka, Yutaka; and Kobayashi, Shinichi, to Robert Bosch GmbH. Sliding vane compressor with end face inserts or rotor. 4,242,065, Cl. 418-91.000.
Issenmann, Edouard M. J. A. I.: *See*—
DePouilly, Bernard M. H.; and Issenmann, Edouard M. J. A. I., 4,242,754, Cl. 375-110.000.
Iten, Clemens A., to American Safety Razor Company. Razor with adjustable blade positioning. 4,241,500, Cl. 30-40.000.
ITI Ltd.: *See*—
Mougin, Georges L., 4,241,685, Cl. 114-264.000.
Ito, Hiroshi: *See*—
Kubo, Seitoku; Kuramochi, Kojiro; and Ito, Hiroshi, 4,241,622, Cl. 74-740.000.
Ito, Rokuzo: *See*—
Halasz, Joseph; and Ito, Rokuzo, 4,241,573, Cl. 57-127.700.
Ito, Sadao; Yoshikawa, Noriaki; and Komura, Mitsuru, to Nippon Telegraph and Telephone Public Corporation. Radio channel control systems of mobile radio telephone systems. 4,242,538, Cl. 179-2.0EB.
Ito, Yutaka; Yajima, Kazuo; Iwanaga, Yoshiteru; Takahashi, Hiroshi; and Inaba, Masao, to Tokyo Broadcasting System Inc.; and Nippon Electric Co., Ltd. Noise reduction system for color television signal. 4,242,704, Cl. 358-167.000.
Itoh, Akira: *See*—
Kato, Akira; Itoh, Akira; and Uchida, Tohru, 4,242,432, Cl. 430-57.000.
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Motoba, Kazuhiko; and Itoh, Eiji, 4,242,314, Cl. 423-139.000.
Itoh, Kiyoo: *See*—
Hori, Ryoichi; and Itoh, Kiyoo, 4,242,739, Cl. 365-203.000.
Itoh, Masumi; and Notani, Jiyoji, to Fujisawa Pharmaceutical Co., Ltd. Sulfonic acid esters. 4,242,507, Cl. 542-427.000.
ITT Industries, Inc.: *See*—
Burgdorf, Jochen; Lupertz, Hans-Henning; and Kast, Helmut, 4,241,812, Cl. 188-73.100.
Lindstedt, Guenter; and Gehrig, Wilfried W., 4,242,664, Cl. 340-168.00S.
Williamson, Roger J., 4,241,612, Cl. 73-861.220.
Ivanov, Vladimir A.: *See*—
Zitser, Vitaly A.; Melnikov, Alexandr V.; Bachelis, Leonid V.; Morozov, Jury E.; Ivanov, Vladimir A.; and Abramova, Zinaida A., 4,241,779, Cl. 164-207.000.
Iwahashi, Shunji; Yamasaki, Masahiro; and Sagou, Masakazu, to Sumitomo Chemical Company, Limited. Vapor plating method for plastics. 4,242,413, Cl. 428-412.000.
Iwamoto, Tsutomu: *See*—
Kobayashi, Shigeru; Namiki, Takemasa; and Iwamoto, Tsutomu, 4,241,689, Cl. 118-50.000.
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Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, 4,242,450, Cl. 435-69.000.
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Tsuboshima, Kosaku; Takayama, Shuichi; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,242,703, Cl. 358-150.000.
Ixion, Inc.: *See*—
Levinson, Leon A.; and Cool, John K., 4,242,701, Cl. 358-75.000.
Izu, Masatsugu; and Cannella, Vincent D., to Energy Conversion Devices, Inc. Dispersion imaging utilizing plural layers of different metal components. 4,242,439, Cl. 430-346.000.
Izumihara, Hiroshi, to Taihei Industries Co., Ltd. Thermal stamping apparatus. 4,242,166, Cl. 156-351.000.
J. I. Case Company: *See*—
Jaecks, Bruce K., 4,241,584, Cl. 60-580.000.
Schmitz, Floyd A., 4,242,034, Cl. 414-686.000.
J. P. Stevens & Co., Inc.: *See*—
Zuckerman, Joseph L.; and Bzik, John W., 4,242,395, Cl. 428-96.000.
Jablonski, Raymond C. Teaching aid. 4,241,522, Cl. 434-405.000.
Jackson, Richard W.; and Seelenbinder, Terry G., to AM International, Inc. Diazo developing apparatus. 4,241,989, Cl. 354-299.000.
Jackson, William L., to Dunlop Limited. Tires. 4,241,775, Cl. 152-330.0RF.
Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Liquid crystal copolyesters containing phenylhydroquinone. 4,242,496, Cl. 528-190.000.
Jaconette, Frank C.: *See*—
D'Amato, Michael J.; and Jaconette, Frank C., 4,241,969, Cl. 339-88.00R.
Jaecks, Bruce K., to J. I. Case Company. Variable biased hydraulic engine speed control. 4,241,584, Cl. 60-580.000.
Jagenberg Werke AG: *See*—
Deimel, Gerhard; and Schmidt, Paul, 4,241,560, Cl. 53-373.000.
Klapp, Hartmut, 4,241,559, Cl. 53-244.000.
Jalil, Asjed A.: *See*—
Vitelli, Vito J.; Jalil, Asjed A.; and Wilson, Norman A., 4,242,153, Cl. 148-12.00B.
Jamaluddin, Aziz A. Air pollution control and heat recovery system for industrial ovens. 4,242,084, Cl. 432-1.000.
James D. Pauls and J. Claybrook Lewis and Associates, Limited: *See*—
Pauls, James D.; Hammett, Roy; and Blake, William S., 4,241,853, Cl. 222-207.000.
Janecek, Jaroslav: *See*—
Cerny, Arnost; and Janecek, Jaroslav, 4,241,619, Cl. 74-440.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Niinomi, Masahiro; and Yanagihara, Kenji, 4,242,188, Cl. 204-164.000.
Javeri, Rupin J., to Motorola, Inc. Ignition spark timing circuit with switchable hysteresis. 4,241,708, Cl. 123-418.000.
Jean Walterscheid GmbH: *See*—
Vollmer, Jurgen; and Muller, Norbert, 4,241,935, Cl. 280-461.00A.
Jebens, Robert W., to RCA Corporation. Solar powered dehumidifier apparatus. 4,242,112, Cl. 55-269.000.
Jem Corporation: *See*—
Curry, Paul F., 4,241,929, Cl. 280-12.00H.
Jenkins, Anthony. Apparatus for the separation of a constituent from an atmosphere. 4,242,107, Cl. 55-18.000.
Jennings Compound Bow, Inc.: *See*—
Jennings, Thomas P., 4,241,715, Cl. 124-24.00R.
Jennings, Marvin D., to International Harvester Company. Electric vehicle having dynamic braking and regeneration. 4,242,617, Cl. 318-13.000.
Jennings, Thomas P., to Jennings Compound Bow, Inc. Compound bow with adjustable eccentric wheel. 4,241,715, Cl. 124-24.00R.
Jensen Building Products, Inc.: *See*—
Jensen, Keith A., 4,241,557, Cl. 52-696.000.
Jensen, Keith A., to Jensen Building Products, Inc. Construction member and plate therefor. 4,241,557, Cl. 52-696.000.
Jensen, Torkil H., to General Atomic Company. Switch arrangement. 4,242,594, Cl. 307-98.000.
Jet Spray Cooler, Inc.: *See*—
Gross, Thomas A. O., 4,242,626, Cl. 318-772.000.
Jinba, Terumasa: *See*—
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,242,557, Cl. 219-69.00E.
Johanson, John E.; and Johanson, Norman E., to Johanson Manufacturing Corporation. Differential disc capacitor. 4,242,716, Cl. 361-299.000.
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Johanson, John E.; and Johanson, Norman E., 4,242,716, Cl. 361-299.000.
Johanson, Norman E.: *See*—
Johanson, John E.; and Johanson, Norman E., 4,242,716, Cl. 361-299.000.
Johansson, Francis J : *See*—
Christenson, Thomas; and Johansson, Francis J., 4,241,476, Cl. 24-3.00R.
John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L. Apparatus for preparing food. 4,241,650, Cl. 99-372.000.
Johns-Manville Corporation: *See*—
Bodycomb, Frederick M., Jr.; and Bauman, Glenn R., 4,241,505, Cl. 30-390.000.
Johnson Controls, Inc.: *See*—
Matthews, Russell B., 4,242,079, Cl. 431-46.000.

Johnson, Dee L.: *See*—
Ronning, Albert J.; Edwards, William H.; and Johnson, Dee L., 4,242,162, Cl. 156-212.000.
Johnson, Edward L.: *See*—
Rich, William E., Jr.; Johnson, Edward L.; and Sidebottom, Thomas O., 4,242,097, Cl. 23-230.00R.
Johnson, Garland A.; and Peuler, Jacob D., to Upjohn Company, The. Radioenzymatic assay of catecholamines. 4,242,222, Cl. 252-301.170.
Johnson, Garland A.; and Peuler, Jacob D., to Upjohn Company, The. Radioenzymatic assay of catecholamines. 4,242,456, Cl. 435-193.000.
Johnson, Herbert G.: *See*—
Hall, Charles M.; and Johnson, Herbert G., 4,242,342, Cl. 424-250.000.
Johnson & Johnson: *See*—
Bourdelle, Peter A.; and Schiff, Norman, 4,241,828, Cl. 206-306.000.
Korpman, Ralf, 4,242,402, Cl. 428-212.000.
Johnson, Joseph H.; and Max, Lee B., to Varian Associates, Inc. Temperature compensating transistor bias device. 4,242,598, Cl. 307-310.000.
Johnson, Ralph E., to Singer Company, The. Inertial thread snubbing device for a sewing machine. 4,241,679, Cl. 112-255.000.
Johnson, Steven R.: *See*—
Anderson, Gordon H.; and Johnson, Steven R., 4,241,545, Cl. 51-163.200.
Jolly, William R.; and Kohn, James G., to Piedmont Industries, Inc. Extensible length sleeve. 4,241,461, Cl. 2-269.000.
Jonath, Eberhard, to Mettler Instrumente AG. Monitoring device and method for a multiplexed segmental display. 4,242,677, Cl. 340-715.000.
Jones, Ian: *See*—
Hawkins, Alan F.; Lewis, Terence; and Jones, Ian, 4,242,121, Cl. 71-93.000.
Jones, Kenneth W., to Reed Tool Company. Drilling bits for plastic formations. 4,241,798, Cl. 175-329.000.
Jordan, Nathaniel, Sr. Cleaning system for tanks. 4,241,744, Cl. 134-168.00R.
Jorg, Siegfried. Transportable treatment recliner. 4,242,086, Cl. 433-33.000.
Josephson, Louis, to American Hardware & Paint Co., Inc. Seal for sides of pivoted blade structures. 4,241,539, Cl. 49-91.000.
Joyner, Taylor B.; Lepie, Albert H.; and Stanifer, Charles D., to United States of America, Navy. Air-curtain incinerator for energetic materials. 4,241,671, Cl. 110-188.000.
Kabushiki Kaisha Cosmo Keiki: *See*—
Furuse, Akio; and Honma, Yoshihiro, 4,241,750, Cl. 137-101.190.
Kabushiki Kaisha Daini Seikosha: *See*—
Tabata, Junichi, 4,242,681, Cl. 340-785.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Seo, Osamu, 4,241,632, Cl. 83-560.000.
Takeuchi, Sadatoshi; Iida, Akio; Miyake, Kimio; and Sakae, Mitsuhisa, 4,241,702, Cl. 123-41.700.
Kabushiki Kaisha Morita Seisakusho: *See*—
Yamano, Hiroyoshi, 4,242,585, Cl. 250-439.00P.
Kabushiki Kaisha Shibaura Denshi Seisakusho: *See*—
Kitamura, Kenzo; Ebitani, Hideaki; and Asakura, Masahiro, 4,242,302, Cl. 422-94.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Morozumi, Shinji; Yamazaki, Yoshio; Asakawa, Tatsushi; and Nakazaki, Yasunori, 4,242,679, Cl. 340-765.000.
Kabushiki Kaisha Tsukuda Hobby: *See*—
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Kabushiki Kaisha Yamashina Seikosho: *See*—
Shimizu, Mituo; and Miyake, Hidenori, 4,241,638, Cl. 85-46.000.
Kaiho, Shigeo: *See*—
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Kaiser, Emil: *See*—
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Kaiser Steel Corporation: *See*—
Pilling, James T., 4,242,154, Cl. 148-16.700.
Kali-Chemie Pharma GmbH: *See*—
Thies, Peter W.; Asai, Akiji; and David, Samuell, 4,242,341, Cl. 424-248.550.
Kampf, Richard S., to Beckman Instruments, Inc. Means for expelling sample carriers from a radiation measuring apparatus. 4,242,582, Cl. 250-328.000.
Kanazawa, Hidege: *See*—
Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, 4,242,450, Cl. 435-69.000.
Kanda, Alvin F., to Beckman Instruments, Inc. Gas discharge tube driver and level shifter circuit. 4,242,615, Cl. 315-169.100.
Kandel, Eduard I.; and Peresedov, Vyacheslav V. Device for putting clips on blood vessels. 4,241,734, Cl. 128-325.000.
Kaneda, Tadao: *See*—
Takahashi, Takashi; Katsura, Masaki; Kaneda, Tadao; Hiraki, Hideaki; and Shiratori, Masayuki, 4,242,303, Cl. 422-98.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamada, Hideaki; Takahashi, Satomi; and Yoneda, Koji, 4,242,452, Cl. 435-117.000.
Kaneko, Kazumasa, to Yasui Sangyo Co., Ltd. Lifting jack with locking device. 4,241,899, Cl. 254-8.00B.
Kanto Denka Kogyo Co., Ltd.: *See*—
Suzuki, Akira; Ishida, Akira; and Oya, Masao, 4,242,484, Cl. 526-273.000.
Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. Solar-radiation collection apparatus. 4,242,580, Cl. 250-203.00R.
Karaba, Albert M.; Kauffman, Brian C.; and Bowen, Glen L., to Teledyne Industries, Inc. Variable compression ratio piston. 4,241,705, Cl. 123-78.00B.
Karinsky, Viktor N.; Kuznetsov, Ivan A.; and Kutsyn, Viktor I. Plasma arc torch head. 4,242,562, Cl. 219-121.00P.
Karn, Helmut: *See*—
Dockner, Toni; Frank, Anton; Kempe, Uwe; Wetzler, Matthias; and Karn, Helmut, 4,242,517, Cl. 548-342.000.
Karsan, Demir I.; Blight, Graham J.; and Farmer, Larry E., to Brown & Root, Inc. Method and apparatus for forming integrated deck sub-structure assembly including arch-vessel passage means. 4,242,011, Cl. 405-204.000.
Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Circuit arrangement for frequency division. 4,242,601, Cl. 307-225.00R.
Kast, Helmut: *See*—
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Kato, Akira; Itoh, Akira; and Uchida, Tohru, to Konishiroku Photo Industry Co., Ltd. Photosensitive material for electrophotography having photosensitive multi-layers. 4,242,432, Cl. 430-57.000.
Kato, Nobukatu; Takase, Tsutomu; Morimoto, Yoshio; Yuasa, Teruo; and Hattori, Minoru, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing isopropenyl phenol. 4,242,528, Cl. 568-781.000.
Kato, Yukio: *See*—
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,242,557, Cl. 219-69.00E.
Katsube, Masayoshi: *See*—
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Katsura, Masaki: *See*—
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Kauer, Johann; and Weick, Heinz H., to Weick, Heinz Hermann. Sealing device for securing or sealing bags or sacks of flexible material. 4,242,171, Cl. 156-485.000.
Kauffman, Brian C.: *See*—
Karaba, Albert M.; Kauffman, Brian C.; and Bowen, Glen L., 4,241,705, Cl. 123-78.00B.
Kaufmann, Meinolph, to BBC Brown Boveri & Company Limited. Sealing cement useful for producing liquid crystal display cells. 4,242,388, Cl. 428-35.000.
Kaufmann, Raimund: *See*—
Steiner, Rudolf; and Kaufmann, Raimund, 4,242,194, Cl. 204-299.00R.
Kaupert, Guenther. Method and apparatus for the forming of a series of troughs into a metal foil strip. 4,241,599, Cl. 72-356.000.
Kausel, Ernst: *See*—
Kellerwessel, Hans; and Kausel, Ernst, 4,242,129, Cl. 75-109.000.
Kawabata, Shigekatsu. Agitator means for tower type abrasion mills. 4,242,002, Cl. 366-343.000.
Kawaguchi, Takeyuki; Taketani, Yutaka; Minematsu, Hiroyoshi; Sasaki, Noriaki; Hayashi, Yuzuru; and Hara, Shigeyoshi, to Teijin Limited. Semipermeable composite membrane and process for preparation thereof. 4,242,208, Cl. 210-500.200.
Kawahara, Toshihisa; and Motoki, Goro, to Yamasa Shoyu Kabushiki Kaisha. S-Adenosyl-L-methionine compositions and production thereof. 4,242,505, Cl. 536-26.000.
Kawanishi, Gosei: *See*—
Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, 4,242,450, Cl. 435-69.000.
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Morito, Nobuyuki; Sugiyama, Toshitomo; Yokoyama, Yasuo; and Ichida, Toshio, 4,242,155, Cl. 148-113.000.
Kawasumi, Yoshio; and Takahashi, Mitsuo, to Nihon Kogyo Kabushika Kaisha. Method for metal plating of powder by substitution. 4,242,376, Cl. 427-216.000.
Kawazu, Satoru: *See*—
Kotani, Norihiko; and Kawazu, Satoru, 4,242,691, Cl. 357-23.000.
Kayser, William M. Multiple tank electric water heater. 4,242,569, Cl. 219-314.000.
KCL Corporation: *See*—
Ferrell, Robert A., 4,241,865, Cl. 229-62.000.
Keene Corporation: *See*—
Fabbri, William C.; and Metcalf, Paul T., II, 4,242,723, Cl. 362-33.000.
Keene, Derek K., deceased (by Keene, Judith H., executrix), to Eaton Corporation. Fluid storage tank for an industrial vehicle. 4,241,578, Cl. 60-478.000.
Keene, Judith H., executrix: *See*—
Keene, Derek K., deceased, 4,241,578, Cl. 60-478.000.
Keller, Charles; and Maria, Paul. Infant bottle air removal means. 4,241,768, Cl. 141-8.000.

Kellerwessel, Hans; and Kausel, Ernst, to Klockner-Humboldt-Wedag AG. Method of recovering metals. 4,242,129, Cl. 75-109.000.
Kelley, Richard B., to Richards of Rockford, Inc. Aerator apparatus. 4,242,199, Cl. 210-758.000.
Kelly, John, Jr., to Mobil Oil Corporation. Method for treating oil-contaminated drill cuttings. 4,242,146, Cl. 134-7.000.
Kelly, Renee J.: *See*—
Antonelli, Joseph A.; Kelly, Renee J.; and McLaughlin, Joseph E., 4,242,243, Cl. 260-23.0AR.
Kelly, Robert C., to Upjohn Company, The. Bicyclic lactones. 4,242,268, Cl. 260-343.30P.
Kempe, Uwe: *See*—
Dockner, Toni; Frank, Anton; Kempe, Uwe; Wetzler, Matthias; and Karn, Helmut, 4,242,517, Cl. 548-342.000.
Kendall, Willard E., to Budd Canada Inc. Frost plug immersion heater and improved clamping structure. 4,242,564, Cl. 219-208.000.
Kennedy, David P.: *See*—
Buckler, Sheldon A.; Cohen, Fredric S.; and Kennedy, David P., 4,242,424, Cl. 429-152.000.
Kennewell, Peter D.: *See*—
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Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Krieg, Gunther; and Obert, Wolfgang, 4,242,584, Cl. 250-423.00P.
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Kessen, Gunther: *See*—
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Kessler, Henry A.; and McEvoy, Richard A., to Warner-Lambert. Bondable agar dental impression material. 4,242,239, Cl. 260-9.000.
Kessler, Milton. Container end closure system. 4,241,864, Cl. 229-43.000.
Khovaylo, Modest, to Precision Cast Specialties, Inc. Prosthetic implant device. 4,241,463, Cl. 3-1.913.
Kii, Masami, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter of the type producing a puff of arc extinguishing gas upon occurrence of an arc. 4,242,550, Cl. 200-148.00R.
Kikkoman Foods, Inc.: *See*—
Yoshioka, Yu, 4,241,855, Cl. 222-479.000.
Kilcher, Beat: *See*—
Ullmann, Werner; Schumacher, Bernd; Ruh, Herbert; and Kilcher, Beat, 4,242,556, Cl. 219-69.00W.
Kilian, Gottfried: *See*—
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Kimberly-Clark Corporation: *See*—
Laumer, Edward P., 4,241,881, Cl. 241-28.000.
Kimbrough, Mahlon D., to Reliance Telecommunication Electronics Company. Frogging signal repeater for a transmission line communications system. 4,242,542, Cl. 179-170.00R.
Kinchla, Timothy: *See*—
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King, Arthur S. Rotary electrodic treater with jet action cleaning. 4,242,190, Cl. 204-212.000.
King, Gerard J.; and Dunn, Aubrey J., to United States of America, Army. Method of making photodetectors using ion implantation and laser annealing. 4,242,149, Cl. 148-1.500.
King, Lloyd H., Sr. Safety valve having a rupturable housing. 4,241,747, Cl. 137-68.00R.
King-Seeley Thermos Co.: *See*—
Anderson, Gordon H.; and Johnson, Steven R., 4,241,545, Cl. 51-163.200.
Kinglor Metor S.p.A.: *See*—
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Kinney, Layton C.: *See*—
Greff, Richard; Wolf, Ludwig, Jr.; Munsch, John; and Kinney, Layton C., 4,242,310, Cl. 422-300.000.
Kinstler, John R.: *See*—
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Kishino, Kunio: *See*—
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Kisiel, Edmund. Battery charger. 4,242,627, Cl. 320-21.000.
Kitagawa, Keishi, to Fuji Photo Film Co., Ltd. Laminate. 4,242,418, Cl. 428-507.000.
Kitagishi, Nozomu, to Canon Kabushiki Kaisha. Telephoto lens. 4,241,983, Cl. 350-216.000.
Kitahara, Tohru: *See*—
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,242,272, Cl. 556-489.000.
Kitamura, Kenzo; Ebitani, Hideaki; and Asakura, Masahiro, to Kabushiki Kaisha Shibaura Denshi Seisakusho. Method of making a catalytic combustion type gas detector. 4,242,302, Cl. 422-94.000.
Kitchen, John A. Pulse combustion apparatus. 4,241,720, Cl. 126-110.00C.
Kitchen, John A. Pulse combustion apparatus. 4,241,723, Cl. 126-350.00R.
Kitzner, Ernest W., to Ford Motor Company. Stirling engine. 4,241,580, Cl. 60-522.000.
Kiuchi, Eichi: *See*—
Musha, Toshimitsu; Sekine, Matsuo; Irabu, Takeru; and Kiuchi, Eichi, 4,242,682, Cl. 343-7.00A.
Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,242,269, Cl. 260-345.100.
Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,242,281, Cl. 568-458.000.
Kiyoura, Tadamitsu, to Mitsui Toatsu Chemicals, Incorporated. Process for producing salts of pyruvic acid. 4,242,525, Cl. 562-577.000.
Klapp, Hartmut, to Jagenberg Werke AG. Lowering and pivoting rail mechanism for a carton filling machine. 4,241,559, Cl. 53-244.000.
Klecker, Johann: *See*—
Matyl, Franz; Klecker, Johann; and Sanguino-Alvarez, Guillermo, 4,241,593, Cl. 64-14.000.
Kleim, Karl-Heinz, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Articulated railway car connecting passage. 4,241,665, Cl. 105-4.00R.
Klein, John M.; and Wilson, Robert B. Energy impact dissolution and trauma reduction device. 4,241,457, Cl. 2-2.500.
Klem, Stanley J. Dispensing container for butter having follower. 4,241,852, Cl. 222-103.000.
Klie, Wolfgang: *See*—
Huber, Guntram; Klie, Wolfgang; Fischer, Wolfgang; Riechers, Daniel; and Hutai, Hubert, 4,241,945, Cl. 293-120.000.
Klimmek, Albrecht; Krieger, Wolfram; and Reiner, Roland, to Battelle-Institut e.V. Process for the production of composite membranes. 4,242,159, Cl. 156-155.000.
Kline, Dale W.: *See*—
Lewis, Raymond H., Jr.; Goodrich, Edward W.; and Kline, Dale W., 4,242,713, Cl. 361-86.000.
Klockner-Humboldt-Wedag AG: *See*—
Kellerwessel, Hans; and Kausel, Ernst, 4,242,129, Cl. 75-109.000.
Klos, Cornelis D. W.: *See*—
Yntema, Klaas; and Klos, Cornelis D. W., 4,242,255, Cl. 260-45.75P.
Knape, Richard S.; and Moreau, Richard A., to General Motors Corporation. Solenoid valve controlled fuel injection pump. 4,241,714, Cl. 123-499.000.
Knauer, Karl, to Siemens Aktiengesellschaft. CTD Transversal filter with parallel inputs. 4,242,654, Cl. 333-165.000.
Knauer, Karl: *See*—
Meusburger, Guenther; Knauer, Karl; and Tihanyi, Jenoe, 4,242,603, Cl. 307-238.000.
Kniep, Peter: *See*—
Buchreiter, Georg; Kniep, Peter; Scheinost, Kurt; and Vollbrecht, Heinz-Rudiger, 4,242,319, Cl. 423-383.000.
Knight Equipment Corp.: *See*—
Mason, William L.; and Russell, William K., 4,242,051, Cl. 417-38.000.
Knight, William M., Jr.: *See*—
McCormack, Kent; Robinson, James E.; Knight, William M., Jr.; and Dudley, Dana, 4,242,706, Cl. 358-213.000.
Knoll, Wayne M.: *See*—
El Bouhnini, Larbi; Fitzpatrick, Thomas J.; Harwick, Donald M.; Hoffman, Robert M.; and Knoll, Wayne M., 4,242,406, Cl. 428-236.000.
Knox, Edward L. Lightweight, portable shelter for backpackers. 4,241,745, Cl. 135-1.00R.
Kobale, Manfred; and Wengert, Rolf, to Siemens Aktiengesellschaft. Process for producing conductive/non-conductive adhesion layers for luminescent materials on flat/uni-directionally bent substrates for image display devices. 4,242,372, Cl. 427-68.000.
Kobayashi, Masaaki; and Fujisawa, Kiyoji, to Matsushita Electric Industrial Co., Ltd. Recording and reproducing apparatus for color video signals. 4,242,699, Cl. 358-4.000.
Kobayashi, Shigeru; Namiki, Takemasa; and Iwamoto, Tsutomu, to Konishiroku Photo Industry Co., Ltd. Coating apparatus. 4,241,689, Cl. 118-50.000.
Kobayashi, Shinichi: *See*—
Ishizuka, Yutaka; and Kobayashi, Shinichi, 4,242,065, Cl. 418-91.000.
Kobayashi, Tadamasa: *See*—
Ban, Hiroshi; Kobayashi, Tadamasa; and Kuno, Syozo, 4,241,820, Cl. 192-89.00B.
Kodama, Masayuki, to Fuji Jukogyo Kabushiki Kaisha. Transmission apparatus for motor vehicle. 4,241,621, Cl. 74-700.000.
Koenig, Alan R.: *See*—
Rosen, Murray; Koenig, Alan R.; and Copham, John D., 4,242,241, Cl. 260-17.200.
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, to Chisso Corporation. Substituted phenethyldichlorosilanes and method for producing same. 4,242,272, Cl. 556-489.000.
Kogler, Georg: *See*—
Schalk, Karl; and Kogler, Georg, 4,242,624, Cl. 318-696.000.
Kohler, George O.: *See*—
Malinow, Manuel R.; McLaughlin, Phyllis A.; Kohler, George O.; and Livingston, Arvin L., 4,242,502, Cl. 536-5.000.
Kohn, James G.: *See*—
Jolly, William R.; and Kohn, James G., 4,241,461, Cl. 2-269.000.
Koike, Norio; and Kubo, Masaharu, to Hitachi, Ltd. Solid-state color imaging device. 4,242,694, Cl. 357-30.000.
Kojima, Michio: *See*—
Ohba, Kazunori; Shomura, Takashi; Kojima, Michio; Omoto, Shoji; Tsuruoka, Takashi; and Inoue, Shigeharu, 4,242,327, Cl. 424-116.000.

Koller, Hans. Apparatus and process for treating pulverized granular material with a fluid stream. 4,241,516, Cl. 34-57.00E.

Komura, Mitsuru: *See—*
Ito, Sadao; Yoshikawa, Noriaki; and Komura, Mitsuru, 4,242,538, Cl. 179-2.0EB.

Kondur, Nicholas, Jr., to C. Itoh Electronics, Inc. Inked ribbon advance and reverse mechanism including a pawl having different size teeth. 4,242,005, Cl. 400-220.100.

Kondur, Nicholas, Jr., to C. Itoh Electronics, Inc. Adjustable media advancement mechanism. 4,242,006, Cl. 400-568.000.

Konig, Eberhard; Schonfelder, Manfred; and Pedain, Josef, to Bayer Aktiengesellschaft. Process for the production of foam plastics based on polyisocyanates having a light and yellowing resistant top layer and resultant product. 4,242,410, Cl. 428-315.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Habu, Teiji; Ishihara, Masao; Terada, Sadatugu; Sakamoto, Eiichi; and Yamada, Hiroshi, 4,242,444, Cl. 430-510.000.
Kato, Akira; Itoh, Akira; and Uchida, Tohru, 4,242,432, Cl. 430-57.000.
Kobayashi, Shigeru; Namiki, Takemasa; and Iwamoto, Tsutomu, 4,241,689, Cl. 118-50.000.

Konno, Kazuhiko: *See—*
Tanaka, Morihisa; Konno, Kazuhiko; Sasaki, Norio; and Uchimura, Kunio, 4,242,277, Cl. 260-396.000.

Konno, Tutomu: *See—*
Aiba, Takaaki; Takahashi, Ryoichi; Hosoi, Takuji; and Konno, Tutomu, 4,242,196, Cl. 208-40.000.

Konrad, Christel: *See—*
Weinlich, Tilman L., 4,242,386, Cl. 428-34.000.

Konstandt, Felix, to Rubin, Milton K. Solutions of polyethylenimine or a hydrophilic derivative thereof and a hydrophilic acrylic polymer and watercraft coated below the waterline therewith. 4,241,682, Cl. 114-67.00R.

Kool Foam Products, Inc.: *See—*
Infantino, Dick S., 4,241,554, Cl. 52-314.000.

Koppl, Georg; Nowack, Helmut; and Carmelo, Violi, to BBC Brown Boveri & Company Limited. Electrical gas-blast circuit breaker and method of manufacture. 4,242,549, Cl. 200-144.00R.

Korhonen, Kaarlo. Off conveyor-line meat-handling apparatus. 4,241,473, Cl. 17-24.000.

Korpman, Ralf, to Johnson & Johnson. Lift-off tape and process. 4,242,402, Cl. 428-212.000.

Korus, Roger A.: *See—*
United States of America, National Aeronautics and Space Administration; Rosser, Robert W.; and Korus, Roger A., 4,242,498, Cl. 528-362.000.

Koski, Ahti A.; and Davidson, Melvin J. G., to Polysar Limited. Ascorbate short-stops. 4,242,477, Cl. 526-84.000.

Kossek, Gunther: *See—*
Pichl, Heinz; and Kossek, Gunther, 4,241,620, Cl. 74-573.00R.

Kostenbauder, Harry B.: *See—*
Hussain, Anwar A.; Truelove, James E.; and Kostenbauder, Harry B., 4,242,330, Cl. 424-180.000.

Kosydar, Karen M.: *See—*
Allcock, Harry R.; Kosydar, Karen M.; and Wright, Sarah D., 4,242,499, Cl. 528-399.000.

Kotani, Norihiko; and Kawazu, Satoru, to Mitsubishi Denki Kabushiki Kaisha. MOS Semiconductor device. 4,242,691, Cl. 357-23.000.

Kotani, Yasuo: *See—*
Hasegawa, Masayasu; Nishikawa, Hideo; and Kotani, Yasuo, 4,242,356, Cl. 424-279.000.

Koutake, Masanobu: *See—*
Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, 4,242,450, Cl. 435-69.000.

Koutsky, Louis J.; and Breitmeyer, Alexander M., to Sears Manufacturing Co. Adjustable seat assembly. 4,241,893, Cl. 248-425.000.

Kovacic, Guido: *See—*
Luhrig, Hermann; Kovacic, Guido; and Muller, Horst-Peter, 4,242,443, Cl. 430-496.000.

Kozima, Akio: *See—*
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, 4,242,260, Cl. 260-160.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Meintker, Manfred; Puthawala, Anwer; Schabert, Hans-Peter; and Strickroth, Erich, 4,242,001, Cl. 366-75.000.

Kramer, Petrus A.: *See—*
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,242,279, Cl. 568-303.000.

Kratzer, Donald K. Tractor drawn ground sweeper. 4,241,792, Cl. 171-63.000.

Kraver, Richard A. Disposable unitary spline installation tool. 4,241,487, Cl. 29-278.000.

Kreiger, John W.: *See—*
Gee, Kenneth H.; and Kreiger, John W., 4,242,142, Cl. 106-97.000.

Kreuer, Karl D.; and Schulte, Klaus, to Leverkusen Aktiengesellschaft. Process and apparatus for the production of a foamable mixture from at least two fluid, foam forming reactants and aggregates. 4,242,306, Cl. 422-133.000.

Krieg, Gunther; and Obert, Wolfgang, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Method for separating isotopes which are in the form of molecules. 4,242,584, Cl. 250-423.00P.

Krieger, Allen S.: *See—*
Silk, John K.; Krieger, Allen S.; and Huang, Eugene W. C., 4,242,588, Cl. 250-492.00A.

Krieger, Wolfram: *See—*
Klimmek, Albrecht; Krieger, Wolfram; and Reiner, Roland, 4,242,159, Cl. 156-155.000.

Krolak, Ronald F.; Perna, Jay; and Radloff, Frederick J., to Bunker Ramo Corporation. Electrical connector assembly for interconnecting remote signal stations to central signal processing systems. 4,242,721, Cl. 361-415.000.

Kubo, Masaharu: *See—*
Koike, Norio; and Kubo, Masaharu, 4,242,694, Cl. 357-30.000.

Kubo, Seitoku; Kuramochi, Kojiro; and Ito, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission with overdrive. 4,241,622, Cl. 74-740.000.

Kuczkowski, Joseph A.: *See—*
Dean, Paul R., II; and Kuczkowski, Joseph A., 4,242,224, Cl. 252-402.000.

Kuda, Vladimir: *See—*
Foltyn, Jan; Henzl, Jindrich; Rotrekl, Otto; and Kuda, Vladimir, 4,241,764, Cl. 139-1.00R.

Kudo, Tetsuichi; and Obayashi, Hidehito, to Hitachi, Ltd. Electrode catalyst. 4,242,421, Cl. 429-13.000.

Kuehn, Erich: *See—*
Feltzin, Joseph; Galvin, Thomas J.; and Kuehn, Erich, 4,242,415, Cl. 428-412.000.

Kuehnle, Manfred R.; and Hagenlocher, Arno K., to Coulter Systems Corp. High speed electrophotographic medium. 4,242,433, Cl. 430-67.000.

Kuhfuss, Herbert F.: *See—*
Jackson, Winston J., Jr.; Gebeau, Gary G.; and Kuhfuss, Herbert F., 4,242,496, Cl. 528-190.000.

Kuhnert, Roland: *See—*
Giesbert, Frank; and Kuhnert, Roland, 4,241,866, Cl. 233-24.000.

Kulmbacher Klimagerate-Werk GmbH & Co. KG: *See—*
Eschner, Axel; and Pohlmann, Erich, 4,241,781, Cl. 165-1.000.

Kundig, Werner: *See—*
Muller, Hans-Rudolf; Kundig, Werner; and Hedinger, Alfred, 4,242,145, Cl. 127-46.00R.

Kundo - Kieninger & Obergfell: *See—*
Scheer, Erich, 4,242,748, Cl. 368-244.000.

Kuni, Asahiro; Akiyama, Nobuyuki; and Oshima, Yoshimasa, to Hitachi, Ltd. Apparatus for automatically checking external appearance of object. 4,242,702, Cl. 358-106.000.

Kuno, Syozo: *See—*
Ban, Hiroshi; Kobayashi, Tadamasa; and Kuno, Syozo, 4,241,820, Cl. 192-89.00B.

Kunze, Karl, to Siemens Aktiengesellschaft. Device for breaking off the wire-like or strip-like electrode in an electro-erosion machine. 4,242,558, Cl. 219-69.00W.

Kuo, Joseph S. C.: *See—*
Cano, Francis J.; Kuo, Joseph S. C.; and Querry, Merle V., 4,242,501, Cl. 536-1.000.

Kuprianov, Alexandr V.: *See—*
Burenkov, Nikolai A.; Derevyanchenko, Mikhail G.; Ioganson, Rikhard A.; Kuprianov, Alexandr V.; Perchenok, Mark B.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,242,609, Cl. 310-105.000.

Kuramochi, Kojiro: *See—*
Kubo, Seitoku; Kuramochi, Kojiro; and Ito, Hiroshi, 4,241,622, Cl. 74-740.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Aiba, Takaaki; Takahashi, Ryoichi; Hosoi, Takuji; and Konno, Tutomu, 4,242,196, Cl. 208-40.000.

Kurihara, Kenji: *See—*
Tsujiyama, Bunjiro; Saito, Kunio; and Kurihara, Kenji, 4,242,662, Cl. 340-146.30H.

Kurisu, Kenichiro: *See—*
Tagawa, Hiroshi; and Kurisu, Kenichiro, 4,241,462, Cl. 2-406.000.

Kurosaki, Shiro: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,242,375, Cl. 427-163.000.

Kurth, William T.: *See—*
Andrulitis, William B.; Miles, Steven G.; and Kurth, William T., 4,241,493, Cl. 29-572.000.

Kurtz, Leonard D.: *See—*
Findl, Eugene; and Kurtz, Leonard D., 4,242,447, Cl. 435-39.000.

Kusaka, Satoshi; and Shino, Kuninori, to Sony Corporation. Tone arm assembly. 4,241,926, Cl. 274-23.00R.

Kushmuk, Walter P., to Continental Scale Corporation. Apparatus to measure elongation due to bending under load. 4,241,801, Cl. 177-211.000.

Kushner, Ben: *See—*
Castillo, Adolfo; Kushner, Ben; and Seipos, Andrew G., 4,241,651, Cl. 100-35.000.

Kutsyn, Viktor I.: *See—*
Karinsky, Viktor N.; Kuznetsov, Ivan A.; and Kutsyn, Viktor I., 4,242,562, Cl. 219-121.00P.

Kuznetsov, Ivan A.: *See—*
Karinsky, Viktor N.; Kuznetsov, Ivan A.; and Kutsyn, Viktor I., 4,242,562, Cl. 219-121.00P.

Kyriacou, Demetrios, to Dow Chemical Company, The. Highly active silver cathode, preparation of same and use to make 2,3,5-trichloropyridine. 4,242,183, Cl. 204-73.00R.

Labouliere, Elzear R.: *See—*
deVos, Hendrik A. J.; and Labouliere, Elzear R., 4,242,727, Cl. 362-346.000.

Laddach, Hans; and Oertel, Werner, to Hein, Lehmann Aktiengesellschaft. Method and device for feeding weft wires. 4,241,767, Cl. 139-443.000.

Lahr, Helmut. Device for automatically watering plant containers. 4,241,538, Cl. 47-79.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Villard, Jean-Claude; and Berthereau, Gilbert, 4,242,039, Cl. 415-112.000.

Laird, Gerald, to Ultradyne, Inc. Self-defense apparatus. 4,242,715, Cl. 361-232.000.

Lajoie, Bernard: *See*—
Lajoie, Marcel; and Lajoie, Bernard, 4,241,551, Cl. 52-90.000.

Lajoie, Marcel; and Lajoie, Bernard. Building structure. 4,241,551, Cl. 52-90.000.

Lake, Connie, to Creative Industries, Inc. Apparatus for heat-trimming foam material. 4,242,074, Cl. 425-292.000.

Laker, Kenneth R.; and Tow, Jimmy, to Bell Telephone Laboratories, Incorporated. Pole quality factor (Q) enhancement technique for notch filters. 4,242,642, Cl. 330-109.000.

Laky, Janos; Csikos, Rezso; Peterfy, Lajos; Szvetelszky, Lajos; and Pallay, Istvan, to Magyar Asvanyolaj es Foldgaz Kiserleti Intezet. Process for the direct separation of isobutylene from mixtures of hydrocarbons. 4,242,526, Cl. 568-697.000.

Lal, Joginder, to Goodyear Tire & Rubber Company, The. Selectively cyclized block copolymers. 4,242,471, Cl. 525-333.000.

Lambert, Clifford L., Jr., to Texaco Development Corporation. Antifreeze composition containing a corrosion inhibitor combination. 4,242,214, Cl. 252-75.000.

Lancia, Frederick N.; Wolfe, William A.; Dearth, Leonard F.; Benton, Stephen L.; Homan, H. Richard; and Bruce, Arthur P. Ice cream cone automatic vending machine. 4,241,847, Cl. 221-12.000.

Landry, Ernest A., Jr. Hand powered high impact tool. 4,241,795, Cl. 173-90.000.

Lane, Joseph A.: *See*—
Walker, Robert; and Lane, Joseph A., 4,241,843, Cl. 220-5.00A.

Lang, Douglas C.: *See*—
Peterson, Wesley R.; and Lang, Douglas C., 4,241,961, Cl. 312-22.000.

Langenberg, Helmut: *See*—
Georg, Werner; Merten, Gerhard; and Langenberg, Helmut, 4,241,824, Cl. 198-745.000.

Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., to ALZA Corporation. Patient-care apparatus with device for dispensing antipathogenic agent. 4,241,733, Cl. 128-275.000.

Larsson, Ake L.; Gronwold, Gunther E.; and Corris, Derek A., to Mattel, Inc. Toy vehicle with spring drive mechanism. 4,241,534, Cl. 46-206.000.

Lartey, Paul A.; and Grampovnik, David J., to Abbott Laboratories. Process for O-demethylating fortimicins. 4,242,503, Cl. 536-17.00R.

Lasis, Evalds, to Polysar Limited. Low benzene butadiene polymerization. 4,242,478, Cl. 526-93.000.

Lauber, Ernst, to Habegger, Willy. Wheel-support assembly for rolling and stepping vehicles, especially cranes, excavating machinery and the like. 4,241,803, Cl. 180-8.00R.

Laumer, Edward P., to Kimberly-Clark Corporation. Fiber separation from pulp sheet stacks. 4,241,881, Cl. 241-28.000.

Laverty, David M.: *See*—
Morgan, Jay E.; DelVecchio, Anthony J.; Brooking, Betty L.; and Laverty, David M., 4,242,366, Cl. 426-554.000.

Lawroski, George. Carrier accessory for vans. 4,241,858, Cl. 224-42.03A.

Le Material Telephonique: *See*—
DePouilly, Bernard M. H.; and Issenmann, Edouard M. J. A. L., 4,242,754, Cl. 375-110.000.

Le Materiel Telephonique: *See*—
Houdard, Jean P., 4,242,641, Cl. 329-126.000.

Lear Siegler, Inc.: *See*—
Pareja, Ramon, 4,242,062, Cl. 417-536.000.
Pareja, Ramon, 4,242,063, Cl. 417-571.000.

Lear Siegler, Inc., Rapistan Division: *See*—
Brouwer, Gerald A., 4,241,825, Cl. 198-782.000.

Lebeault, Jean-Michel: *See*—
Christ, Charles; Lebeault, Jean-Michel; and Noel, Claude, 4,242,361, Cl. 426-49.000.

LeBlanc, Edgar J.; Venezia, Lawrence; and Kinchla, Timothy. Skater's device. 4,241,506, Cl. 33-27.00C.

Le Chatelier, Jacques, to Societe Alsacienne de Constructions Mechaniques de Mulhouse. Rotors of freed-fiber spinning devices. 4,241,572, Cl. 57-58.890.

Lecolier, Serge L.; Malfroot, Thierry A.; Piteau, Marc D.; and Senet, Jean-Pierre G., to Societe Nationale des Poudres et Explosifs. Process for the preparation of halogeno-mercuri-aldehydes and -ketones. 4,242,280, Cl. 260-431.000.

le Comte, Adolf. Ventilator. 4,241,645, Cl. 98-37.000.

Lee, Conrad E., to Pako Corporation. Stripping roller with protective sleeve. 4,241,911, Cl. 271-314.000.

Lee, Gim F., Jr., to General Electric Company. Composition of a polyphenylene ether, a block copolymer of a vinyl aromatic compound and a conjugated diene and a polyolefin. 4,242,263, Cl. 260-306.00R.

Lee, Robert L. Articulator yoke assembly. 4,242,087, Cl. 433-54.000.

Leeds & Northrup Company: *See*—
Baxter, Ronald D.; and Freud, Paul J., 4,242,659, Cl. 338-28.000.
Morse, Richard H., 4,241,701, Cl. 122-460.000.

Leeper, Harold: *See*—
Langston, Jimmy B.; Leeper, Harold; and Wong, Patrick S., 4,241,733, Cl. 128-275.000.

Lehmann, Gunter: *See*—
Diem, Hans; Dudeck, Christian; Lehmann, Gunter; Matthias, Guenther; and Petri, Norbert, 4,242,282, Cl. 568-471.000.

Lehovec, Kurt, to University of Southern California. Tunnel diode load for ultra-fast low power switching circuits. 4,242,595, Cl. 307-205.000.

Leib, Ronald J.; and Sparks, Moses, Jr., to Armstrong Cork Company. Reinforced primary backing for tufted pile fabrics. 4,242,394, Cl. 428-95.000.

Leiber, Wolfgang; and Ruesch, Hans J., to Carl Hurth Maschinen-und Zahnradfabrik. Drive mechanism for machines, having in particular a great moment of inertia. 4,241,817, Cl. 192-12.00C.

Leibowitz, Marshall, to Timex Corporation. Simplified field effect, twisted nematic liquid crystal display construction. 4,241,984, Cl. 350-337.000.

Leibowitz, Marvin: *See*—
Roberts, Karl H.; Leibowitz, Marvin; and Furgal, Henry P., 4,242,377, Cl. 427-242.000.

Leidich, Arthur J., to RCA Corporation. Variable gain current amplifier. 4,242,643, Cl. 330-278.000.

Leister, Harry M.: *See*—
Hall, Wilbur S.; and Leister, Harry M., 4,242,379, Cl. 427-327.000.

Leland, David L., to Miles Laboratories, Inc. Method for the introduction of a methyl group into the 7 position of the morphinan nucleus. 4,242,514, Cl. 546-74.000.

Lendla, Heinz: *See*—
Link, Heinz; Schupp, Heribert; and Lendla, Heinz, 4,241,762, Cl. 138-105.000.

Lenz, Rudiger: *See*—
Schwellinger, Ulrich; and Lenz, Rudiger, 4,241,889, Cl. 244-3.150.

Leonard, John F.: *See*—
Fritts, David H.; Leonard, John F.; and Palanisamy, Thirumalai G., 4,242,179, Cl. 204-2.100.

Leonard, Robert D., Jr.; and Nestor, Charles R., to General Motors Corporation. Pigtail assembly. 4,241,971, Cl. 339-116.00C.

Lepie, Albert H.: *See*—
Joyner, Taylor B.; Lepie, Albert H.; and Stanifer, Charles D., 4,241,671, Cl. 110-188.000.

Lepp, George D. Camera support bracket. 4,241,988, Cl. 354-293.000.

Lescrenier, Charles. Patient positioning device comprising light planes corresponding to first, second and third intersecting reference planes. 4,242,587, Cl. 250-491.000.

Lesesne, Mary. Bunting for attachment to a seat. 4,241,458, Cl. 2-69.500.

Leupen, Willem H. L., to Heuga Australia Production Pty. Ltd. Carpet tiles. 4,242,393, Cl. 428-95.000.

Leveque, Robert, to Creusot-Loire. Chromizing of steels by gaseous method. 4,242,151, Cl. 148-6.350.

Leverkusen Aktiengesellschaft: *See*—
Kreuer, Karl D.; and Schulte, Klaus, 4,242,306, Cl. 422-133.000.

Levin, Alan, III: *See*—
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Mohrsen, Leif, to Durad Machine Company, Ltd. Sheet positioner. 4,242,023, Cl. 414-36.000.
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Mon, George, to United States of America, Army. Fluidic valve. 4,241,760, Cl. 137-829.000.
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Muller, Werner C.; and Miller, Franklyn D., 4,242,455, Cl. 435-162.000.

National Research Development Corporation: *See—*
Dobson, John V., 4,242,189, Cl. 204-195.00R.

National Semiconductor Corporation: *See—*
Smith, Frederick J., 4,242,604, Cl. 307-251.000.
Stone, Richard H., 4,242,152, Cl. 148-9.500.

National Starch and Chemical Corporation: *See—*
Stanley, Henry; and Ray-Chaudhuri, Dilip K., 4,242,488, Cl. 428-423.100.

Natural Energy of Oklahoma, Inc.: *See—*
Zwayer, Don L.; and Sadler, Martin D., 4,241,913, Cl. 272-130.000.

NCR Corporation: *See—*
Boone, James G., 4,242,639, Cl. 328-155.000.

Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, to Roussel Uclaf. Novel 3-(aminoethyl)-phenols. 4,242,355, Cl. 424-275.000.

Nelson, Alfred O.; and Nelson, Betty Jo. Mouse trap. 4,241,531, Cl. 43-69.000.

Nelson, Betty Jo: *See—*
Nelson, Alfred O.; and Nelson, Betty Jo, 4,241,531, Cl. 43-69.000.

Nelson, Eric W.: *See—*
Van Klompenburg, Marlo G.; Peterson, Jeffery A.; and Nelson, Eric W., 4,241,541, Cl. 49-249.000.

Nelson, Hollis E.; and Seely, Donald G. Centralized automatic pilot/pilotless ignition control system. 4,242,078, Cl. 431-45.000.

Nelson, Richard L.; and Nelson, Walter P., to Mars Incorporated. Apparatus for making filled food product. 4,241,649, Cl. 99-354.000.

Nelson, Walter P.: *See—*
Nelson, Richard L.; and Nelson, Walter P., 4,241,649, Cl. 99-354.000.

Nemeth, Jozsef, to AB Wicanders Korkfabriker. Floor tile. 4,242,390, Cl. 428-47.000.

Nemoto, Akira; and Hamaguchi, Yasunori. Boot seal. 4,241,928, Cl. 277-212.0FB.

Nestor, Charles R.: *See—*
Leonard, Robert D., Jr.; and Nestor, Charles R., 4,241,971, Cl. 339-116.00C.

Nestrick, Terry J.; and Stehl, Rudolph H., to Dow Chemical Company, The. Chromatographic column packing having a bonded organosiloxane coating. 4,242,227, Cl. 252-428.000.

Neuroth, Juergen: *See—*
Baack, Michael; Bartkowiak, Artur; and Neuroth, Juergen, 4,242,468, Cl. 521-170.000.

Neville, William A.: *See—*
Buddemeyer, Bruce D.; Neville, William A.; Taylor, James S.; and Bourne, Richard G., 4,242,364, Cl. 426-98.000.

New World Manufacturing, Inc.: *See—*
Yarimie, Chris M.; and Moore, Jerry E., 4,241,465, Cl. 5-452.000.

Newell, Alfred T., Jr.: *See—*
Newell, Alfred T., III; and Newell, Alfred T., Jr., 4,241,871, Cl. 236-49.000.

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Newing, Charles W., to Owens-Illinois, Inc. Preparation of organopolysiloxane resins with weak organic bases. 4,242,252, Cl. 260-33.4SB.

Newlon, Charles E., to United States of America, Energy. Device for absorbing mechanical shock. 4,241,810, Cl. 188-1.00C.

Newroyd Limited: *See—*
Hinch, Peter G.; Hall, Kenneth F.; and Chambers, George, 4,241,680, Cl. 112-275.000.

Newsome, Reginald W. Aerial toy glider. 4,241,533, Cl. 46-74.00D.

NGK Insulators, Ltd.: *See—*
Higuchi, Noboru; and Futamura, Shoji, 4,242,075, Cl. 425-462.000.

Nicholas, David M.; and Hegarty, William P., to Air Products and Chemicals, Inc. Hydrogen sulfide concentrator for acid gas removal systems. 4,242,108, Cl. 55-40.000.

Nieuwendijk, Joris A. M.: *See—*
Heijnemans, Werner A. L.; Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., 4,242,612, Cl. 313-421.000.

Nihon Kogyo Kabushika Kaisha: *See—*
Kawasumi, Yoshio; and Takahashi, Mitsuo, 4,242,376, Cl. 427-216.000.

Niinomi, Masahiro; and Yanagihara, Kenji, to Japan Synthetic Rubber Co., Ltd. Method for controlling plasma chemical reactions. 4,242,188, Cl. 204-164.000.

Ninomiya, Kenjiro: *See—*
Mitani, Minoru; Hashimoto, Kiyoharu; Ninomiya, Kenjiro; Miyazaki, Toshikiyo; Hashimoto, Otokuma; and Mori, Hideki, 4,242,401, Cl. 428-201.000.

Nippon Electric Co., Ltd.: *See—*
Ito, Yutaka; Yajima, Kazuo; Iwanaga, Yoshiteru; Takahashi, Hiroshi; and Inaba, Masao, 4,242,704, Cl. 358-167.000.
Musha, Toshimitsu; Sekine, Matsuo; Irabu, Takeru; and Kiuchi, Eichi, 4,242,682, Cl. 343-7.00A.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Sata, Tekeo; Takamura, Masayuki; Yamagishi, Tomoo; Hoshi, Toshiharu; and Iijima, Kenzaburo, 4,242,711, Cl. 360-126.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, 4,242,336, Cl. 424-246.000.
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Nippon Hardboard Co., Ltd.: *See—*
Nakajima, Shiro; and Miyata, Toshiro, 4,242,163, Cl. 156-242.000.

Nippon Kogaku K.K.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,242,557, Cl. 219-69.00E.

Nippon Oil Company, Limited: *See—*
Tsuchiya, Shozo; and Hayashi, Hideo, 4,242,475, Cl. 525-534.000.

Nippon Steel Corporation: *See—*
Nagashima, Sachio; and Wake, Makoto, 4,241,904, Cl. 266-209.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Ito, Sadao; Yoshikawa, Noriaki; and Komura, Mitsuru, 4,242,538, Cl. 179-2.0EB.
Tsujiyama, Bunjiro; Saito, Kunio; and Kurihara, Kenji, 4,242,662, Cl. 340-146.30H.

Nippon Zeon Co., Ltd.: *See*—
Suzuki, Akira; Ishida, Akira; and Oya, Masao, 4,242,484, Cl. 526-273.000.

Nishikawa, Hideo: *See*—
Hasegawa, Masayasu; Nishikawa, Hideo; and Yoshida, Kayoko, 4,242,336, Cl. 424-246.000.
Hasegawa, Masayasu; Nishikawa, Hideo; and Kotani, Yasuo, 4,242,356, Cl. 424-279.000.

Nishiki Co., Ltd.: *See*—
Tagawa, Hiroshi; and Kurisu, Kenichiro, 4,241,462, Cl. 2-406.000.

Nissan Chemical Industries, Ltd.: *See*—
Tsuchihashi, Genichi; Ogura, Katsuyuki; Sakoda, Ryozo; Hashiba, Isao; and Fukushima, Shuichi, 4,242,522, Cl. 560-47.000.

Nissan Motor Company, Limited: *See*—
Fujii, Toshihiko, 4,242,172, Cl. 156-499.000.
Fujii, Toshihiko, 4,242,399, Cl. 428-186.000.
Fukunaga, Yukio, 4,241,968, Cl. 339-64.00M.
Mizote, Masanori; Yamaki, Kiyoshi; and Oka, Takashi, 4,242,731, Cl. 364-436.000.
Tsuruta, Mitsuo; and Haga, Hachiro, 4,241,646, Cl. 98-115.0SB.
Ushiro, Masayuki; and Shimazaki, Haruo, 4,241,766, Cl. 139-435.000.

Nissen, Ole J.: *See*—
Dyhr, Jan; and Nissen, Ole J., 4,242,056, Cl. 417-363.000.

Noble, David; and Noble, Donald. Adjustable exercise apparatus. 4,241,915, Cl. 272-144.000.

Noble, Donald: *See*—
Noble, David; and Noble, Donald, 4,241,915, Cl. 272-144.000.

Noel, Claude: *See*—
Christ, Charles; Lebeault, Jean-Michel; and Noel, Claude, 4,242,361, Cl. 426-49.000.

Noll, Walter; Meininger, Fritz; and Hoyer, Ernst, to Hoechst Aktiengesellschaft. Water-soluble dyestuffs, processes for their manufacture, their use as fiber-reactive dyestuffs for dyeing and printing fiber materials and the fiber materials dyed with these dyestuffs. 4,242,258, Cl. 260-152.000.

Nonnenmann, Wolfgang, to Robert Bosch GmbH. Magnetic final control element for a regulator apparatus. 4,242,606, Cl. 310-12.000.

Nonoyama, Takao; and Sato, Kunihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vacuum transmitting valve. 4,241,751, Cl. 137-103.000.

Nordson Corporation: *See*—
Hastings, Donald R., 4,241,880, Cl. 239-691.000.
Lissy, Gunter J., 4,242,113, Cl. 55-302.000.

Norris, George F.: *See*—
Murphy, Gary J.; and Norris, George F., 4,241,909, Cl. 271-182.000.

Northern Telecom, Inc.: *See*—
Wernet, William F.; Adams, William J.; and Haskins, Steve W., 4,242,543, Cl. 200-1.00A.

Northern Telecom Limited: *See*—
Szpakowski, Bronislaw T.; and DeGregorio, Bruno, 4,242,630, Cl. 323-60.000.

Northrop Corporation: *See*—
Deal, Bruce C., 4,242,733, Cl. 364-515.000.
Deal, Bruce C., 4,242,734, Cl. 364-515.000.

Norton, Thomas K. Color calculator. 4,241,520, Cl. 434-102.000.

Notani, Jiyoji: *See*—
Itoh, Masumi; and Notani, Jiyoji, 4,242,507, Cl. 542-427.000.

Novicky, Nick N. Oxygen permeable hard and semi-hard contact lens compositions, methods and articles of manufacture. 4,242,483, Cl. 526-263.000.

Nowack, Helmut: *See*—
Koppl, Georg; Nowack, Helmut; and Carmelo, Violi, 4,242,549, Cl. 200-144.00R.

Noxell Corporation: *See*—
Schnabel, Peter W.; Chernack, Milton P.; Wilkes, Lawrence T.; and Perry, Gordon R., 4,241,743, Cl. 132-88.700.

NSK-Warner K.K.: *See*—
Yamamoto, Kazuo, 4,241,941, Cl. 280-804.000.

Nulph, Robert J.: *See*—
Nametz, Richard C.; and Nulph, Robert J., 4,242,473, Cl. 525-397.000.

Numata, Masayuki; and Sugano, Kenji, to Meiji Seika Kaisha, Ltd. Process for producing fried banana slices. 4,242,365, Cl. 426-438.000.

Nurk, Siegfried, to SIPRA Patententwicklungs- und Beteiligungsgesellschaft mbH. Apparatus for shrinking of textile webs. 4,241,478, Cl. 26-18.500.

Oakes, Richard M. Windmill power generator. 4,242,050, Cl. 416-170.00R.

Obayashi, Hidehito: *See*—
Kudo, Tetsuichi; and Obayashi, Hidehito, 4,242,421, Cl. 429-13.000.

Obendorf, Johann: *See*—
Gras, Rainer; Obendorf, Johann; and Wolf, Elmar, 4,242,248, Cl. 260-31.20N.

Obert, Wolfgang: *See*—
Krieg, Gunther; and Obert, Wolfgang, 4,242,584, Cl. 250-423.00P.

O'Boyle, Matthew; Icore, Bernard; and Harney, Marilyn J., to Catalyst Research Corporation. Novel lithium halide battery structure. 4,242,425, Cl. 429-181.000.

Occidental Research Corporation: *See*—
Hard, Robert A., 4,241,951, Cl. 299-2.000.

O'Connor, Joseph M.; and Pasternak, Stephen F., to Peerless of America, Inc. Heat exchangers and method of making same. 4,241,785, Cl. 165-172.000.

Odenthal, Charles: *See*—
Bennett, Clifford D.; and Odenthal, Charles, 4,241,756, Cl. 137-496.000.

Oertel, Werner: *See*—
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Ogawa, Haruki: *See*—
Sugawara, Yutaka; Yamamoto, Akihiro; Handa, Mitsuaki; Usami, Hiroko; and Ogawa, Haruki, 4,242,326, Cl. 424-116.000.

Ogawa, Hisashi: *See*—
Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, 4,241,939, Cl. 280-804.000.
Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, 4,241,940, Cl. 280-804.000.

Ogden, Ralph; and Colley, John C., to Ogden, Ralph, a part interest. Method and apparatus for dispensing welding flux. 4,242,007, Cl. 406-109.000.

Ogino, Takashi: *See*—
Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, 4,242,510, Cl. 544-27.000.

Ogle, Peter C.: *See*—
Ferris, Donald L.; and Ogle, Peter C., 4,242,047, Cl. 416-134.00A.

Ogura, Katsuyuki: *See*—
Tsuchihashi, Genichi; Ogura, Katsuyuki; and Mitamura, Shuichi, 4,242,519, Cl. 560-15.000.
Tsuchihashi, Genichi; Ogura, Katsuyuki; Sakoda, Ryozo; Hashiba, Isao; and Fukushima, Shuichi, 4,242,522, Cl. 560-47.000.

Ohba, Kazunori; Shomura, Takashi; Kojima, Michio; Omoto, Shoji; Tsuruoka, Takashi; and Inoue, Shigeharu, to Meiji Seika Kaisha, Ltd. Antibiotic SF-2052 substance and production and use thereof. 4,242,327, Cl. 424-116.000.

Ohba, Shozo: *See*—
Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, 4,242,450, Cl. 435-69.000.

Ohgushi, Masuhito: *See*—
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,242,272, Cl. 556-489.000.

Ohio State University Research Foundation, The: *See*—
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,241,519, Cl. 434-43.000.

Ohsaka, Yohnosuke, to Daikin Kogyo Co., Ltd. Process for preparing benzotrifluoride and its derivatives. 4,242,286, Cl. 570-145.000.

Ohta, Masafumi: *See*—
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, 4,242,260, Cl. 260-160.000.

Ohta, Wasaburo: *See*—
Hirakura, Koji; Ikeda, Itsuo; Ohta, Wasaburo; and Okuno, Zenjiro, 4,242,434, Cl. 430-122.000.

Oka, Takashi: *See*—
Mizote, Masanori; Yamaki, Kiyoshi; and Oka, Takashi, 4,242,731, Cl. 364-436.000.

Oka, Yoshihiko: *See*—
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.

Okamoto, Michio: *See*—
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Okamura, Kiyohito: *See*—
Yajima, Seishi; Okamura, Kiyohito; Shishido, Toetsu; and Hasegawa, Yoshio, 4,242,487, Cl. 528-25.000.

Okano, Teruo: *See*—
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Okegawa, Osamu: *See*—
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Okuda, Genzaburo. Quick acting hydraulic lifting jack. 4,241,900, Cl. 254-8.00B.

Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Compact wide angle zoom lens. 4,241,981, Cl. 350-184.000.

Okumura, Toshiaki: *See*—
Tsuchiya, Shiro; Imakita, Itsuo; and Okumura, Toshiaki, 4,242,073, Cl. 425-149.000.

Okuno, Zenjiro: *See*—
Hirakura, Koji; Ikeda, Itsuo; Ohta, Wasaburo; and Okuno, Zenjiro, 4,242,434, Cl. 430-122.000.

Okuyama, Teiji, to Aisin Seiki Kabushiki Kaisha. Seat suspension apparatus. 4,241,894, Cl. 248-576.000.

Olin Corporation: *See*—
Ford, James M., 4,242,184, Cl. 204-98.000.
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., 4,242,131, Cl. 75-157.500.
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., 4,242,132, Cl. 75-157.500.
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., 4,242,133, Cl. 75-157.500.

Olin, John F.: *See*—
Hamm, Philip C.; and Olin, John F., 4,242,122, Cl. 71-100.000.

Oliveira, Robert J.; and Silver, Spencer F., to Minnesota Mining and Manufacturing Company. Immunoassay for antigens. 4,242,096, Cl. 23-230.00B.

Oliver, Leland W.; Moore, John R.; Willcox, Peter S.; von Harz, James L.; and Trivison, Robert J., to International Telephone and Telegraph Corporation. Contact retention clip and method of inserting same in an insulator. 4,241,976, Cl. 339-278.00D.

Ollivier, Christian: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,242,203, Cl. 210-321.100.

Olson, Daniel R.: *See*—
Goossens, John C.; and Olson, Daniel R., 4,242,381, Cl. 427-387.000.
Goossens, John C.; and Olson, Daniel R., 4,242,383, Cl. 427-387.000.

Olson, Elvin G., to Boeing Company, The. Adhesive dispersing anvil and method of using. 4,242,158, Cl. 156-92.000.

Olson, Karl W.: *See*—
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,241,519, Cl. 434-43.000.

Olympus Optical Co., Ltd.: *See*—
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Tsuboshima, Kosaku; Takayama, Shuichi; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,242,703, Cl. 358-150.000.

Omoto, Shoji: *See*—
Ohba, Kazunori; Shomura, Takashi; Kojima, Michio; Omoto, Shoji; Tsuruoka, Takashi; and Inoue, Shigeharu, 4,242,327, Cl. 424-116.000.

Omron Tateisi Electronics Co.: *See*—
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Omura, Satoshi: *See*—
Sakakibara, Hideo; Okegawa, Osamu; Watanabe, Toshiyuki; Fujiwara, Tatsuro; Watanabe, Susumu; Omura, Satoshi; and Matsuda, Tetsuo, 4,242,504, Cl. 536-17.00R.

Ondetti, Miguel A.: *See*—
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O'Neill, Sean P., to Electro-Nucleonics Laboratories, Inc. Methods and materials for detecting antigens and antibodies. 4,242,322, Cl. 424-1.000.

Onuma, Nobuo: *See*—
Suzuki, Masayuki; Onuma, Nobuo; Ishizuka, Fumihiko; Hara, Shinichi; Osawa, Akira; and Fukuzawa, Akira, 4,242,177, Cl. 162-17.000.

Oppenlaender, Knut: *See*—
Vogel, Hans-Henning; Oppenlaender, Knut; and Starke, Klaus, 4,242,101, Cl. 44-58.000.

Orchard, Paul D. Cow-restraining device. 4,241,699, Cl. 119-14.030.

Orillo, Stephen, Jr.: *See*—
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, 4,241,623, Cl. 74-765.000.

Orion Industries, Inc.: *See*—
Ibaraki, Howard, 4,241,851, Cl. 222-83.500.

Orr, Vernon E.: *See*—
Whiteman, Paul L.; and Orr, Vernon E., 4,242,032, Cl. 414-537.000.

Osawa, Akira: *See*—
Suzuki, Masayuki; Onuma, Nobuo; Ishizuka, Fumihiko; Hara, Shinichi; Osawa, Akira; and Fukuzawa, Akira, 4,242,177, Cl. 162-17.000.

Oshima, Yoshimasa: *See*—
Kuni, Asahiro; Akiyama, Nobuyuki; and Oshima, Yoshimasa, 4,242,702, Cl. 358-106.000.

Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, to Yamanouchi Pharmaceutical Co., Ltd. 7-Methoxy cephalosporins and process of producing them. 4,242,449, Cl. 435-48.000.

Ostergren, William F., to Sperry Corporation. Drive system for a manure spreader. 4,241,879, Cl. 239-677.000.

Ostrofsky, Bernard: *See*—
Bergman, Jack N.; and Ostrofsky, Bernard, 4,241,609, Cl. 73-623.000.

Ottenstein, Allan S.: *See*—
Callahan, John A.; and Ottenstein, Allan S., 4,242,575, Cl. 235-92.0FL.

Otterson, Lewis L., to Weatherchem Corporation. Child-resistant fluid top. 4,241,856, Cl. 222-539.000.

Ouchi, Hirobumi; and Mukai, Toji, to Hitachi, Ltd. Low dark current photo-semiconductor device. 4,242,695, Cl. 357-30.000.

Oudet, Claude; and Guerin, Yves, to Portescap. Miniature electric stepping motor. 4,242,623, Cl. 318-696.000.

Outboard Marine Corporation: *See*—
DuBois, Edmund H.; Erlandson, Robert K.; and Miller, Allan F., 4,241,687, Cl. 440-63.000.

Outokumpu Oy: *See*—
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Owens-Illinois, Inc.: *See*—
Gagnon, Donald W.; and Tillman, James J., 4,242,250, Cl. 260-33.4SB.
Newing, Charles W., 4,242,252, Cl. 260-33.4SB.
Snow, Thomas G., 4,241,627, Cl. 81-3.46R.

Oya, Masao: *See*—
Suzuki, Akira; Ishida, Akira; and Oya, Masao, 4,242,484, Cl. 526-273.000.

Pailer, Mathias; and Wagner, Roland, to Rowa Limited. Choleretic pharmaceutical compositions and method of treatment. 4,242,360, Cl. 424-343.000.

Pako Corporation: *See*—
Lee, Conrad E., 4,241,911, Cl. 271-314.000.

Palanisamy, Thirumalai G.: *See*—
Fritts, David H.; Leonard, John F.; and Palanisamy, Thirumalai G., 4,242,179, Cl. 204-2.100.

Paliv AG: *See*—
Friz, Helmut A., 4,241,697, Cl. 118-713.000.

Pallay, Istvan: *See*—
Laky, Janos; Csikos, Rezso; Peterfy, Lajos; Szvetelszky, Lajos; and Pallay, Istvan, 4,242,526, Cl. 568-697.000.

Palm, Robert J. No-tie sports goals. 4,241,916, Cl. 273-1.50R.

Palmer, Keith W.: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,242,233, Cl. 252-431.00N.

Pannell, Otis R. Method and system for two-queen operation and requeening of honey bee colonies. 4,241,467, Cl. 6-1.000.

Panol, Georg: *See*—
Chick, William L.; Galletti, Pierre M.; Richardson, Peter D.; and Panol, Georg, 4,242,459, Cl. 435-283.000.
Chick, William L.; Galletti, Pierre M.; Richardson, Peter D.; and Panol, Georg, 4,242,460, Cl. 435-284.000.

Pareja, Ramon, to Lear Siegler, Inc. Dual piston pump with pressure seal lubrication feature. 4,242,062, Cl. 417-536.000.

Pareja, Ramon, to Lear Siegler, Inc. High pressure multi-cylinder pump. 4,242,063, Cl. 417-571.000.

Parker, Donnie G.; and Milligan, James D., to Tri-Pak, Inc. Motor fuel composition. 4,242,100, Cl. 44-53.000.

Parker, Lawrence J., to Shelter Insulation, Inc. Process for crimping a non-woven mat and foam structure produced therewith. 4,242,409, Cl. 428-297.000.

Parker, Louis W.: *See*—
Hedges, Rhey W., 4,242,625, Cl. 318-729.000.

Parker, Michael S. Rockable furniture. 4,241,949, Cl. 297-3.000.

Parking Control Systems: *See*—
Malinovitz, Raphael, 4,241,943, Cl. 283-13.000.

Parrish, John F., to Shell Oil Company. Floating shunt seismic amplifier. 4,242,741, Cl. 367-21.000.

Parsons, Ralph L., Jr. Boom mower mounting frame for over center transport. 4,241,565, Cl. 56-10.700.

Parsons, Ronald; and Slattery, Ian, to Spencer Wright Industries, Inc. Tufting machine looper with clip. 4,241,676, Cl. 112-79.00A.

Partenheimer, Walter, to Standard Oil Company (Indiana). Removal of dissolved copper from aqueous solution also containing dissolved cobalt or manganese. 4,242,128, Cl. 75-109.000.

Passarotti, Carlo: *See*—
Gandolfi, Carmelo; Passarotti, Carlo; Andreoni, Alessandro; Fumagalli, Angelo; Faustini, Franco; Ceserani, Roberto; and Usardi, Maria M., 4,242,508, Cl. 542-430.000.

Pasternak, Stephen F.: *See*—
O'Connor, Joseph M.; and Pasternak, Stephen F., 4,241,785, Cl. 165-172.000.

Patel, Chandra K. N.: *See*—
Dayem, Aly H.; Geballe, Theodore H.; Patel, Chandra K. N.; and Tien, Ping K., 4,242,419, Cl. 428-661.000.

Patel, Chimanbhai M.; and Magyar, Joseph J., to General Motors Corporation. Winding prevention belt retractor for passive shoulder belt system. 4,241,938, Cl. 280-803.000.

Patel, Gordhanbhai N.: *See*—
Yee, Kwok C.; Preziosi, Anthony F.; Patel, Gordhanbhai N.; Chance, Ronald R.; Miller, Granville G.; and Baughman, Ray H., 4,242,440, Cl. 430-346.000.

Paul Revere Corporation: *See*—
Baldauf, Dale, 4,241,577, Cl. 60-420.000.

Pauley, James H. Universal arm support. 4,241,731, Cl. 128-94.000.

Pauliukonis, Richard S. Electro-thermal linear pull actuator. 4,242,571, Cl. 219-513.000.

Pauls, James D.; Hammett, Roy; and Blake, William S., to James D. Pauls and J. Claybrook Lewis and Associates, Limited. Dispenser for either continuous or intermittent discharge. 4,241,853, Cl. 222-207.000.

Paxson Machine Company: *See*—
Buta, John R.; Gehring, John H.; and Drotleff, Thomas J., 4,242,024, Cl. 414-43.000.

Payne, Thomas R.: *See*—
Hurko, Bohdan; and Payne, Thomas R., 4,242,554, Cl. 219-10.55B.

Pearson, Raymond E., to Boeing Company, The. Aerial delivery system. 4,241,890, Cl. 244-137.00R.

Pease Company: *See*—
Bursk, William M., 4,241,556, Cl. 52-455.000.

Peck, Clifton S., to Chrysler Corporation. Wheel bearing slinger ring. 4,241,957, Cl. 308-36.400.

Pedain, Josef: *See*—
Konig, Eberhard; Schonfelder, Manfred; and Pedain, Josef, 4,242,410, Cl. 428-315.000.

Pedersen, George H., to General Motors Corporation. Variable area exhaust nozzle. 4,241,876, Cl. 239-265.270.

Peel, John L., to Rockwell International Corporation. Method of fabricating an SOS island edge passivation structure. 4,242,156, Cl. 148-175.000.

Peeples, Denny L., to General Motors Corporation. Hydraulic ratio changing booster with self-venting chamber. 4,241,642, Cl. 91-391.00R.

Peerless of America, Inc.: *See*—
O'Connor, Joseph M.; and Pasternak, Stephen F., 4,241,785, Cl. 165-172.000.
Pell, Terrell G. Golf tube separator insert. 4,241,774, Cl. 150-1.50R.
Pellon, Joseph J.; and Savoy, Paul D., to American Cyanamid Company. Process for water-in-oil emulsions of water-soluble polymers. 4,242,247, Cl. 260-29.6WQ.
Penarowski, Arthur: *See*—
McKenna, Phillip; and Penarowski, Arthur, 4,241,807, Cl. 182-121.000.
Pennington, Fred A., Jr.: *See*—
Pennington, Fred A., Sr.; Pennington, Fred A., Jr.; and Porr, John W., Jr., 4,241,601, Cl. 73-17.00R.
Pennington, Fred A., Sr.; Pennington, Fred A., Jr.; and Porr, John W., Jr., to Andrew S. McCreath & Son, Inc. Pre-set automatically operable means for measuring the plasticity of test specimens including apparatus for indicating and recording the results thereof. 4,241,601, Cl. 73-17.00R.
Pennsylvania Engineering Corporation: *See*—
Fisher, Howard M.; and Nagati, Rashed N., 4,241,902, Cl. 266-44.000.
Perazzo, Luis R. C. Sheet of polishing fibers comprising fibrous layers bonded with particles of thermoplastic material. 4,241,469, Cl. 15-209.00C.
Perchenok, Mark B.: *See*—
Burenkov, Nikolai A.; Derevyanchenko, Mikhail G.; Ioganson, Rikhard A.; Kuprianov, Alexandr V.; Perchenok, Mark B.; Chegodaev, Evgeny V.; and Chulin, Valentin I., 4,242,609, Cl. 310-105.000.
Peresedov, Vyacheslav V.: *See*—
Kandel, Eduard I.; and Peresedov, Vyacheslav V., 4,241,734, Cl. 128-325.000.
Perethian, Charles; and Vetter, Craig W., to Vetter Corporation. Saddle bag. 4,241,857, Cl. 224-32.00A.
Perkins, Jean K. Fluid temperature mixing indicator. 4,241,868, Cl. 236-12.00A.
Perna, Jay: *See*—
Krolak, Ronald F.; Perna, Jay; and Radloff, Frederick J., 4,242,721, Cl. 361-415.000.
Perotto, Jean-Felix: *See*—
Piguet, Christian; and Perotto, Jean-Felix, 4,242,676, Cl. 340-711.000.
Perrone, Michael A. Foot care instrument. 4,241,499, Cl. 30-27.000.
Perry, Gordon R.: *See*—
Schnabel, Peter W.; Chernack, Milton P.; Wilkes, Lawrence T.; and Perry, Gordon R., 4,241,743, Cl. 132-88.700.
Personnat, Patrice. Combination hand-tool. 4,241,773, Cl. 145-63.000.
Persson, Sven J. Apparatus for conveying granular material. 4,242,015, Cl. 406-82.000.
Peterfy, Lajos: *See*—
Laky, Janos; Csikos, Rezso; Peterfy, Lajos; Szvetelszky, Lajos; and Pallay, Istvan, 4,242,526, Cl. 568-697.000.
Peterson, Jeffery A.: *See*—
Van Klompenburg, Marlo G.; Peterson, Jeffery A.; and Nelson, Eric W., 4,241,541, Cl. 49-249.000.
Peterson, Wesley R.; and Lang, Douglas C., to Singer Company, The. Two level sewing machine cabinet. 4,241,961, Cl. 312-22.000.
Peterson, William A., Jr.; and Marchak, Roman O., to Bendix Corporation, The. Closed loop system. 4,241,710, Cl. 123-440.000.
Petri, Norbert: *See*—
Diem, Hans; Dudeck, Christian; Lehmann, Gunter; Matthias, Guenther; and Petri, Norbert, 4,242,282, Cl. 568-471.000.
Petursson, Sigurdur G. Pressure compensating valve. 4,241,749, Cl. 137-100.000.
Peuler, Jacob D.: *See*—
Johnson, Garland A.; and Peuler, Jacob D., 4,242,222, Cl. 252-301.170.
Johnson, Garland A.; and Peuler, Jacob D., 4,242,456, Cl. 435-193.000.
Philibert, Daniel: *See*—
Azadian, Genevieve; Philibert, Daniel; and Pierdet, Andre, 4,242,335, Cl. 424-243.000.
Phillips Petroleum Company: *See*—
Allison, George M., III, 4,242,245, Cl. 260-27.0BB.
Carter, Cecil O., 4,242,531, Cl. 585-512.000.
Ford, Gregory A., 4,242,207, Cl. 210-500.100.
Stapp, Paul R., 4,242,228, Cl. 252-429.00R.
Welch, M. Bruce, 4,242,480, Cl. 526-125.000.
Young, Jerry W., 4,241,848, Cl. 221-222.000.
Pichl, Heinz; and Kossek, Gunther, to AB Volvo Penta. Balance wheel. 4,241,620, Cl. 74-573.00R.
Piedmont Industries, Inc.: *See*—
Jolly, William R.; and Kohn, James G., 4,241,461, Cl. 2-269.000.
Pierdet, Andre: *See*—
Azadian, Genevieve; Philibert, Daniel; and Pierdet, Andre, 4,242,335, Cl. 424-243.000.
Piguet, Christian; and Perotto, Jean-Felix, to Centre Electronique Horloger SA. Interactive device for data input into an instrument of small dimensions. 4,242,676, Cl. 340-711.000.
Pilling, James T., to Kaiser Steel Corporation. Preheat and cleaning system. 4,242,154, Cl. 148-16.700.
Pillsbury Company, The: *See*—
Morgan, Jay E.; DelVecchio, Anthony J.; Brooking, Betty L.; and Laverty, David M., 4,242,366, Cl. 426-554.000.
Pinter, Warren H.; and Smith, Dale E., to United Technologies Corporation. Method of winding a wind turbine blade using a filament reinforced mandrel. 4,242,160, Cl. 156-175.000.
Pinto, Alwyn, to Imperial Chemical Industries Limited. Ammonia synthesis process. 4,242,317, Cl. 423-359.000.
Piteau, Marc D.: *See*—
Lecolier, Serge L.; Malfroot, Thierry A.; Piteau, Marc D.; and Senet, Jean-Pierre G., 4,242,280, Cl. 260-431.000.
Pitney Bowes Inc.: *See*—
Scribner, Albert W., 4,242,566, Cl. 219-216.000.
Plevak, Lubomir; and Dodt, Jurgen, to Gewerkschaft Eisenhutte Westfalia. Pivot joint for underground mining installations. 4,242,014, Cl. 405-300.000.
Plows, Graham S. Transponders. 4,242,671, Cl. 340-572.000.
Podolan, Edward G.; and Przybysz, Francis C., to General Motors Corporation. Vehicle door window assembly. 4,241,542, Cl. 49-352.000.
Pohlmann, Erich: *See*—
Eschner, Axel; and Pohlmann, Erich, 4,241,781, Cl. 165-1.000.
Polaroid Corporation: *See*—
Buckler, Sheldon A.; Cohen, Fredric S.; and Kennedy, David P., 4,242,424, Cl. 429-152.000.
Polheimer, Lars: *See*—
Marcusson, Lage; and Polheimer, Lars, 4,241,666, Cl. 105-59.000.
Polychrome Corporation: *See*—
Huang, Jen-chi, 4,242,417, Cl. 428-457.000.
Polysar Limited: *See*—
Koski, Ahti A.; and Davidson, Melvin J. G., 4,242,477, Cl. 526-84.000.
Lasis, Evalds, 4,242,478, Cl. 526-93.000.
Popescu, Francine. Bright tin electroplating bath. 4,242,182, Cl. 204-54.00R.
Popovici, Neculai; Dochia, Mihail; Dumitrescu, Mihai; Spirea, Iosif; and Samoil, Iacob. Controllable reaction medium single reactor for phosphoric acid production. 4,242,308, Cl. 422-195.000.
Poritz, Nathan. Perpetual calendar. 4,241,526, Cl. 40-110.000.
Porr, John W., Jr.: *See*—
Pennington, Fred A., Sr.; Pennington, Fred A., Jr.; and Porr, John W., Jr., 4,241,601, Cl. 73-17.00R.
Porter, Robert E. Tubular work feeder for sewing machine. 4,241,681, Cl. 112-322.000.
Portescap: *See*—
Oudet, Claude; and Guerin, Yves, 4,242,623, Cl. 318-696.000.
Poryair Limited: *See*—
Boutle, David L., 4,242,464, Cl. 521-61.000.
Possati, Mario, to Finike Italiana Marposs, S.p.A. Modular electronic apparatus for processing a plurality of measurement signals. 4,241,509, Cl. 33-174.0PA.
Pouey, Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Monochromators. 4,241,999, Cl. 356-331.000.
Poulsen, Peder U. Windmill. 4,242,043, Cl. 416-11.000.
Powell, James E., to Shell Oil Company. Cyclopropanecarboxylate pesticides. 4,242,521, Cl. 560-35.000.
Powers, James C.: *See*—
Moran, Thomas F.; Powers, James C.; and Lively, Mark O., III, 4,242,186, Cl. 204-157.10H.
PPG Industries, Inc.: *See*—
El Bouhnini, Larbi; Fitzpatrick, Thomas J.; Harwick, Donald M.; Hoffman, Robert M.; and Knoll, Wayne M., 4,242,406, Cl. 428-236.000.
Mayer, Thomas A.; and Sickles, James E., 4,241,973, Cl. 339-143.00R.
Prapas, Aristotle G., to Mobil Oil Corporation. UV Light resistant p-methylstyrene/methyl methacrylate copolymer. 4,242,485, Cl. 526-329.200.
Precision Cast Specialties, Inc.: *See*—
Khovaylo, Modest, 4,241,463, Cl. 3-1.913.
Prefco Products, Inc.: *See*—
McCabe, Francis J., 4,241,748, Cl. 137-77.000.
Preload Technology, Inc.: *See*—
Marchaj, Tadeusz J., 4,242,052, Cl. 417-154.000.
Preziosi, Anthony F.: *See*—
Yee, Kwok C.; Preziosi, Anthony F.; Patel, Gordhanbhai N.; Chance, Ronald R.; Miller, Granville G.; and Baughman, Ray H., 4,242,440, Cl. 430-346.000.
Price, Ernest H. Downhole separator for wells. 4,241,787, Cl. 166-105.000.
Price, Ernest J., to E. J. Price (Developments) Limited. Foot pumps. 4,242,060, Cl. 417-464.000.
Primas, Willi: *See*—
August, Peter; and Primas, Willi, 4,242,486, Cl. 528-14.000.
Prince Corporation: *See*—
Marcus, Konrad H., 4,241,870, Cl. 296-37.700.
Pringle, William L., to Friedman, Leonard. Brake shoe assembly, apparatus and method for making same. 4,241,600, Cl. 72-411.000.
Proce, James R.: *See*—
Gidewall, Kenneth L.; and Proce, James R., 4,241,558, Cl. 53-79.000.
Prochazka, Svante: *See*—
Cusano, Dominic A.; Holub, Fred F.; and Prochazka, Svante, 4,242,221, Cl. 252-301.40H.
Produits Chimiques Ugine Kuhlmann: *See*—
Cognion, Jean-Marie; and Kervennal, Jacques, 4,242,235, Cl. 252-455.00R.

Pruchno, Albert A.: *See*—
Handelsman, Steven K.; and Pruchno, Albert A., 4,242,290, Cl. 261-41.00D.

Przybylski, Zdzislaw: *See*—
Edinger, Egon; and Przybylski, Zdzislaw, 4,241,570, Cl. 57-1.0UN.

Przybysz, Francis C.: *See*—
Podolan, Edward G.; and Przybysz, Francis C., 4,241,542, Cl. 49-352.000.

Pullman Incorporated: *See*—
Marulic, Walter J., 4,241,552, Cl. 52-282.000.

Purdue Research Foundation: *See*—
Hem, Stanley L.; and White, Joe L., 4,242,328, Cl. 424-157.000.

Puschel, Walter; Vetter, Hans; and Marx, Paul, to AGFA-Gevaert, A.G. Photographic dye diffusion transfer process. 4,242,435, Cl. 430-242.000.

Puthawala, Anwer: *See*—
Meintker, Manfred; Puthawala, Anwer; Schabert, Hans-Peter; and Strickroth, Erich, 4,242,001, Cl. 366-75.000.

Quarenghi, Rodolfo, to Cir - S.p.A. - Divisione Sasib. Cigarette packing machines. 4,241,564, Cl. 53-575.000.

Quayle, Stephen R. Vest for photographers. 4,241,459, Cl. 2-102.000.

Querry, Merle V.: *See*—
Cano, Francis J.; Kuo, Joseph S. C.; and Querry, Merle V., 4,242,501, Cl. 536-1.000.

Quilico, Carlo A.; and Troya, Paolo M., to FIAT Societa per Azioni. Device for converting sea wave energy into electrical energy. 4,242,593, Cl. 290-53.000.

Quinn, Richard J.: *See*—
Schmitt, Joseph M.; and Quinn, Richard J., 4,242,469, Cl. 525-71.000.

Quiri: *See*—
Hubrecht, Gerard; and Mechain, Gerard, 4,241,816, Cl. 188-298.000.

R.G.B. Laboratories, Inc.: *See*—
Buddemeyer, Bruce D.; Neville, William A.; Taylor, James S.; and Bourne, Richard G., 4,242,364, Cl. 426-98.000.

R & I Patent Corporation: *See*—
Shepard, Francis H., Jr., 4,242,622, Cl. 318-616.000.

Rabo, Jule A.; Elek, Louis F.; and Francis, James N., to Union Carbide Corporation. Cyclic two step process for production of methane from carbon monoxide. 4,242,103, Cl. 48-197.00R.

Radecki, Ronald P. Aid for hanging pictures. 4,241,510, Cl. 33-180.00R.

Radloff, Frederick J.: *See*—
Krolak, Ronald F.; Perna, Jay; and Radloff, Frederick J., 4,242,721, Cl. 361-415.000.

Radva Plastics Corporation: *See*—
Dickens, Luther I.; and Nanny, William C., 4,241,555, Cl. 52-454.000.

Raffel, Jack I.; and Yasaitis, John A., to Massachusetts Institute of Technology. Capacitor memory and methods for reading, writing, and fabricating capacitor memories. 4,242,736, Cl. 365-191.000.

Ragen, Robert A., to Xerox Corporation. Multi-pass matrix printing. 4,242,003, Cl. 400-124.000.

Rajpara, Jagdish: *See*—
Ehrenthal Irving; Shieh, Kenneth K.; Scallet, Barrett L.; and Rajpara, Jagdish, 4,242,451, Cl. 435-94.000.

Ramelow, Hermann: *See*—
Christner, Hans; Roebke, Wolfgang; Ramelow, Hermann; and Dittrich, Fwald, 4,242,223, Cl. 252-313.00R.

Raschack, Manfred: *See*—
Albrecht, Hans P.; von Philipsborn, Gerda; Siebeneick, Hans U.; and Raschack, Manfred, 4,242,332, Cl. 424-182.000.

Rausch, John J.; and Van Thyne, Ray J., to Rausch, John J.; Van Thyne, Ray J.; and Material Sciences Corporation. Selective chromizing in a molten lead medium. 4,242,420, Cl. 428-667.000.

Rawyler-Ehrat, Ernst. Process of combustion. 4,242,076, Cl. 431-4.000.

Ray-Chaudhuri, Dilip K.: *See*—
Stanley, Henry; and Ray-Chaudhuri, Dilip K., 4,242,488, Cl. 428-423.100.

Raychem Corporation: *See*—
Batliwalla, Neville S., 4,242,573, Cl. 219-528.000.

Raytheon Company: *See*—
Cappon, Arthur M.; Collins, John D.; and Sage, Jay P., 4,242,683, Cl. 343-7.700.
Cocca, Theodore F., 4,242,660, Cl. 338-195.000.

RCA Corporation: *See*—
Bloom, Allen; and Bartolini, Alfred, 4,242,689, Cl. 346-135.100.
Carlson, David J.; and Yu, John P., 4,242,655, Cl. 333-183.000.
Dingwall, Andrew G. F., 4,242,738, Cl. 365-189.000.
Jebens, Robert W., 4,242,112, Cl. 55-269.000.
Leidich, Arthur J., 4,242,643, Cl. 330-278.000.
Schroeder, John O., 4,242,644, Cl. 330-297.000.
Weimer, Paul K., 4,242,700, Cl. 358-44.000.

Ream, Gregory L.: *See*—
Dees, Raymond K.; Van Laanen, Peter J.; and Ream, Gregory L., 4,241,608, Cl. 73-606.000.

Recordex Limited: *See*—
Ryan, Keith, 4,241,962, Cl. 312-183.000.

Reed Tool Company: *See*—
Jones, Kenneth W., 4,241,798, Cl. 175-329.000.

Reichert, Rudolf: *See*—
Dienemann, Wolfgang; and Reichert, Rudolf, 4,241,587, Cl. 62-80.000.

Reicherts, James E.; and Veschuroff, William C., to United States Gypsum Company. Mobile home ceiling construction and method for making. 4,241,553, Cl. 52-309.500.

Reid, John: *See*—
Siemsen, Klaus J.; and Reid, John, 4,242,645, Cl. 331-94.50G.

Reiko Co., Ltd.: *See*—
Arai, Yoshiaki, 4,242,378, Cl. 427-264.000.

Reilly, Albert F.: *See*—
Sanok, John L.; and Reilly, Albert F., 4,242,463, Cl. 521-51.000.

Reinardy, Peter: *See*—
Wiedenfeld, Helmut; and Reinardy, Peter, 4,241,480, Cl. 28-213.000.

Reiner, Roland: *See*—
Klimmek, Albrecht; Krieger, Wolfram; and Reiner, Roland, 4,242,159, Cl. 156-155.000.

Reinert, Friedrich, to BASF Aktiengesellschaft. Process of preparing a finishing composition containing aziridine radicals used for reducing the shrinkage and felting of wood. 4,242,210, Cl. 252-8.800.

Reinert, Gerald H. Pilot assembly for hydraulic pumps. 4,241,641, Cl. 91-189.00A.

Reinhardt, Hans; Schmahl, Manfred; and Tritsch, Armin, to Freudenberg, Carl. Noise barrier pad and the method for the production of same. 4,242,391, Cl. 428-76.000.

Reisinger, Konrad: *See*—
Finck, Herbert; and Reisinger, Konrad, 4,242,750, Cl. 371-22.000.

Reliance Telecommunication Electronics Company: *See*—
Kimbrough, Mahlon D., 4,242,542, Cl. 179-170.00R.

Remmert, Patrick A., to Thermo Electric Co., Inc. Thermocouple surface probe. 4,242,148, Cl. 136-221.000.

Remy, David C., to Merck & Co., Inc. Orexigenic use of pyrrolo[2,1-b][3]benzazepines. 4,242,349, Cl. 424-267.000.

Renga, James M., to Dow Chemical Company, The. Novel 2,6-dinitrophenyl selenium compounds and their use as epoxidation catalysts. 4,242,285, Cl. 260-348.310.

Reppel, Heinz: *See*—
Bergmann, Klaus; Schmitz, Friedrich; Kilian, Gottfried; and Reppel, Heinz, 4,242,144, Cl. 106-281.00R.

Republic Packaging Company: *See*—
Hardy, Charles T., 4,241,829, Cl. 206-328.000.

Reschovsky, John M.; and Hunt, Gerald P., to General Electric Company. Range selectable contactless data acquisition system for rotating machinery. 4,242,666, Cl. 340-870.280.

Rettien, Claude: *See*—
Gasc, Jean-Claude; and Rettien, Claude, 4,242,331, Cl. 424-180.000.

Revertex Limited: *See*—
Baack, Michael; Bartkowiak, Artur; and Neuroth, Juergen, 4,242,468, Cl. 521-170.000.

Revillet, Georges: *See*—
Farkas, Rudolf; Moulin, Michel; and Revillet, Georges, 4,241,998, Cl. 356-319.000.

Reynolds, Mark P.: *See*—
Babcock, Bryce W.; Reynolds, Mark P.; and Saluja, Kulbir, 4,241,819, Cl. 192-70.270.

RF Products Corp.: *See*—
Callahan, John A.; and Ottenstein, Allan S., 4,242,575, Cl. 235-92.0FL.

Rheinische Kalksteinwerke GmbH: *See*—
Bergmann, Klaus; Schmitz, Friedrich; Kilian, Gottfried; and Reppel, Heinz, 4,242,144, Cl. 106-281.00R.

Rhodes, Arthur J.; and Rhodes, William J. Bearing assembly for an automatic shaping device. 4,241,771, Cl. 144-145.00A.

Rhodes, William J.: *See*—
Rhodes, Arthur J.; and Rhodes, William J., 4,241,771, Cl. 144-145.00A.

Rhone-Poulenc Industries: *See*—
Cerny, Jacqueline; and Vivant, Gilbert, 4,242,240, Cl. 260-14.000.

Riaz, Mahmoud: *See*—
Mohan, Narendra; and Riaz, Mahmoud, 4,242,628, Cl. 322-35.000.

Ricci, Louis N.: *See*—
Maier, Alfred E.; and Ricci, Louis N., 4,242,577, Cl. 200-153.00G.

Ricciardi, Mario J., to A. B. Dick Company. Duplicating machine with duplexing capability. 4,241,658, Cl. 101-217.000.

Rich, William E., Jr.; Johnson, Edward L.; and Sidebottom, Thomas O., to Dionex Corporation. Method and apparatus for quantitative analysis of weakly ionized anions or cations. 4,242,097, Cl. 23-230.00R.

Richards of Rockford, Inc.: *See*—
Kelley, Richard B., 4,242,199, Cl. 210-758.000.

Richardson, Edwin A.: *See*—
Davies, David R.; and Richardson, Edwin A., 4,241,791, Cl. 166-292.000.

Richardson, Peter D.: *See*—
Chick, William L.; Galletti, Pierre M.; Richardson, Peter D.; and Panol, Georg, 4,242,459, Cl. 435-283.000.
Chick, William L.; Galletti, Pierre M.; Richardson, Peter D.; and Panol, Georg, 4,242,460, Cl. 435-284.000.

Ricoh Company, Ltd.: *See*—
Hirakura, Koji; Ikeda, Itsuo; Ohta, Wasaburo; and Okuno, Zenjiro, 4,242,434, Cl. 430-122.000.
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, 4,242,260, Cl. 260-160.000.

Rider, Clarence N., Jr.; and Rudy, William J., Jr., to AMP Incorporated. Electrical connector having improved receptacle terminal. 4,241,970, Cl. 339-99.00R.

Riechers, Daniel: *See*—
Huber, Guntram; Klie, Wolfgang; Fischer, Wolfgang; Riechers, Daniel; and Hutai, Hubert, 4,241,945, Cl. 293-120.000.

Riel, Frank J., to Rohr Industries, Inc. Method of foaming perforate sheet material from wire mesh. 4,242,176, Cl. 156-630.000.

Risch, Alan P.: *See—*
Frost, Albert C.; and Risch, Alan P., 4,242,104, Cl. 48-197.00R.
Rizzo, Joseph F.: *See—*
Gilmer, John L.; and Rizzo, Joseph F., 4,242,636, Cl. 328-63.000.
Robert Bosch GmbH: *See—*
Frister, Manfred, 4,241,959, Cl. 308-187.000.
Ishizuka, Yutaka; and Kobayashi, Shinichi, 4,242,065, Cl. 418-91.000.
Nonnenmann, Wolfgang, 4,242,606, Cl. 310-12.000.
Roberts, Karl H.; Leibowitz, Marvin; and Furgal, Henry P., to Colgate-Palmolive Company. Fabric conditioning. 4,242,377, Cl. 427-242.000.
Robertshaw Controls Company: *See—*
Bauer, Werner R., 4,241,486, Cl. 29-157.10R.
Branson, Charles D.; and Demi, Roy C., 4,242,082, Cl. 431-72.000.
Demi, Roy C., 4,242,083, Cl. 431-72.000.
Frankenberg, Alfred A., 4,241,872, Cl. 236-87.000.
Robertson, Joseph D., to Anaconda Company, The. Fueling unit apparatus. 4,241,770, Cl. 141-198.000.
Robinson, Gene P. Reversible toilet paper holder. 4,241,885, Cl. 242-55.200.
Robinson, James E.: *See—*
McCormack, Kent; Robinson, James E.; Knight, William M., Jr.; and Dudley, Dana, 4,242,706, Cl. 358-213.000.
Robinson, Merritt A.: *See—*
Harrington, Duane E.; and Robinson, Merritt A., 4,242,170, Cl. 156-438.000.
Roch, Gerald V. Milling machine. 4,242,019, Cl. 409-185.000.
Rockwell International Corporation: *See—*
Eshghy, Siavash, 4,241,488, Cl. 29-407.000.
Gehle, Richard W., 4,242,157, Cl. 156-64.000.
Huffman, Charles E.; McGuire, Robert J.; and Welch, Herbert E., 4,242,756, Cl. 455-8.000.
Peel, John L., 4,242,156, Cl. 148-175.000.
Smith, William A., 4,241,783, Cl. 165-48.00R.
Roebke, Wolfgang: *See—*
Christner, Hans; Roebke, Wolfgang; Ramelow, Hermann; and Dittrich, Ewald, 4,242,223, Cl. 252-313.00R.
Roemer, Hans; and Steil, Klaus-Peter, to Siemens Aktiengesellschaft. Method and apparatus for the electro-erosive machining of workpieces with automatic threading of the electrode. 4,242,559, Cl. 219-69.00W.
Rogers, Darrell O.: *See—*
Eggen, Hans C.; Halajian, Eugene M.; Danner, Edward L.; and Rogers, Darrell O., 4,241,937, Cl. 280-777.000.
Rogov, Viktor F.; Lipatov, Nikolai K.; Tatevosian, Ruben A.; Titov, Mikhail Y.; Tereschenko, Lev A.; and Yakovlev, Arian M. Rapid-setting dry packing mix for eliminating bore hole troubles and method of manufacture thereof. 4,242,141, Cl. 106-89.000.
Rohde, Wolfgang, to Bergwerksverband GmbH; and Didier Engineering GmbH. Process and apparatus for drying and preheating of coking coal in a single flight stream tube. 4,241,513, Cl. 34-10.000.
Rohloff, Robert R., to Minnesota Mining and Manufacturing Company. Photosensitized polyamic acids curable by exposure to actinic radiation. 4,242,437, Cl. 430-270.000.
Rohr Industries, Inc.: *See—*
Riel, Frank J., 4,242,176, Cl. 156-630.000.
Rohte, Oskar: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,242,345, Cl. 424-253.000.
Ronning, Albert J.; Edwards, William H.; and Johnson, Dee L., to Minnesota Mining and Manufacturing Company. Tape applying device and method. 4,242,162, Cl. 156-212.000.
Rosen, Melvin H., to Ciba-Geigy Corporation. 1-Benzothiepin-4-carboxylic acid derivatives. 4,242,266, Cl. 260-326.340.
Rosen, Murray; Koenig, Alan R.; and Copham, John D., to Celotex Corporation, The. Method for making a slurry containing particulate matter and fibers for a preformed insulation product. 4,242,241, Cl. 260-17.200.
Roser, Siegfried: *See—*
Mayr, Bertold; and Roser, Siegfried, 4,241,707, Cl. 123-90.550.
Ross, Sidney D.; Finkelstein, Manuel; and Dunkl, Franz S., to Sprague Electric Company. Capacitor containing anthranilate electrolyte. 4,242,722, Cl. 361-433.000.
Rosser, Robert W.: *See—*
United States of America, National Aeronautics and Space Administration; Rosser, Robert W.; and Korus, Roger A., 4,242,498, Cl. 528-362.000.
Rossing, Martin A.; and McDonald, Ray S., to Medtronic, Inc. Reset means for programmable digital cardiac pacemaker. 4,241,736, Cl. 128-419.0PG.
Rossmann, Axel: *See—*
Huther, Werner; Schweitzer, Klaus; and Rossmann, Axel, 4,242,294, Cl. 264-62.000.
Rossy, Phillip; and Hoffmann, Werner, to BASF Aktiengesellschaft. Thiophene compounds and their manufacture. 4,242,518, Cl. 549-61.000.
Rothe, Bruce. Collapsible building structure. 4,241,746, Cl. 135-4.00R.
Rothert, Horst: *See—*
Voelskow, Peter; Rothert, Horst; and Schlotterer, Gustav, 4,242,197, Cl. 209-3.000.
Rothschild, Gerald W.: *See—*
Hartmann, William F., 4,241,932, Cl. 280-265.000.
Rotoflow Corporation: *See—*
Swearingen, Judson S., 4,242,040, Cl. 415-113.000.
Rotrekl, Otto: *See—*
Foltyn, Jan; Henzl, Jindrich; Rotrekl, Otto; and Kuda, Vladimir, 4,241,764, Cl. 139-1.00R.
Rottmar, Werner, to Endress u. Hauser GmbH u. Co. Fixing of sonic transducer to a container. 4,242,744, Cl. 367-173.000.
Roussel Uclaf: *See—*
Azadian, Genevieve; Philibert, Daniel; and Pierdet, Andre, 4,242,335, Cl. 424-243.000.
Barnes, Alan C.; and Kennewell, Peter D., 4,242,267, Cl. 260-335.000.
Gasc, Jean-Claude; and Rettien, Claude, 4,242,331, Cl. 424-180.000.
Nedelec, Lucien; Frechet, Daniel; and Dumont, Claude, 4,242,355, Cl. 424-275.000.
Rovac Corporation, The: *See—*
Edwards, Thomas C., 4,241,591, Cl. 62-402.000.
Rowa Limited: *See—*
Pailer, Mathias; and Wagner, Roland, 4,242,360, Cl. 424-343.000.
Rowe, Lacy A. Gutter hanger. 4,241,548, Cl. 52-11.000.
Rowe, Neal E.: *See—*
Shariff, Sadiq A.; Wilson, John R.; Bharteey, Brij M.; and Rowe, Neal E., 4,242,718, Cl. 361-341.000.
Rubin, Milton K.: *See—*
Konstandt, Felix, 4,241,682, Cl. 114-67.00R.
Rudenauer, Werner; and Siewert, Ralf, to Diehl GmbH & Co. Electrical projectile detonator. 4,241,662, Cl. 102-210.000.
Rudnick, Leslie R., to Mobil Oil Corporation. Extraction of tar sands or oil shale with organic sulfoxides or sulfones. 4,242,195, Cl. 208-11.0LE.
Rudolph, Dale C., to Unirad Corporation. Overhead arm assembly. 4,241,891, Cl. 248-123.100.
Rudy, William J., Jr.: *See—*
Rider, Clarence N., Jr.; and Rudy, William J., Jr., 4,241,970, Cl. 339-99.00R.
Ruehle, William H., to Mobil Oil Corporation. Seismic refraction exploration. 4,242,740, Cl. 367-15.000.
Ruesch, Hans J.: *See—*
Leiber, Wolfgang; and Ruesch, Hans J., 4,241,817, Cl. 192-12.00C.
Ruh, Herbert: *See—*
Ullmann, Werner; Schumacher, Bernd; Ruh, Herbert; and Kilcher, Beat, 4,242,556, Cl. 219-69.00W.
Ruhrchemie Aktiengesellschaft: *See—*
Hibbel, Josef; Kessen, Gunther; and Meis, Josef, 4,242,283, Cl. 568-451.000.
Russell, William K.: *See—*
Mason, William L.; and Russell, William K., 4,242,051, Cl. 417-38.000.
Ryan, John W., to Agrow Plow Pty. Limited. Vibrating device. 4,241,615, Cl. 74-61.000.
Ryan, Keith, to Recordex Limited. Storage apparatus for records and the like. 4,241,962, Cl. 312-183.000.
Ryan, Le Roy J., Jr. Visually descriptive information transmission, storage, and retrieval set. 4,241,994, Cl. 355-77.000.
Ryder, Francis E., to Ryder International Corporation. Contact lens disinfector with temperature indicator. 4,242,304, Cl. 422-119.000.
Ryder, Francis E.: *See—*
Thomas, Michael D.; and Ryder, Francis E., 4,242,572, Cl. 219-521.000.
Ryder International Corporation: *See—*
Ryder, Francis E., 4,242,304, Cl. 422-119.000.
Thomas, Michael D.; and Ryder, Francis E., 4,242,572, Cl. 219-521.000.
Saban, John F., to Western Electric Company, Inc. Boxed metallized film capacitor. 4,242,717, Cl. 361-308.000.
Sachs, Emanual M., to Mobil Tyco Solar Energy Corporation. Apparatus for monitoring crystal growth. 4,242,589, Cl. 250-577.000.
Sack & Kiesselbach Maschinenfabrik GmbH: *See—*
Cremer, Kurt H. L., 4,241,598, Cl. 72-354.000.
Sadler, Martin D.: *See—*
Zwayer, Don L.; and Sadler, Martin D., 4,241,913, Cl. 272-130.000.
Sagami Chemical Research Center: *See—*
Tsuchihashi, Genichi; Ogura, Katsuyuki; and Mitamura, Shuichi, 4,242,519, Cl. 560-15.000.
Tsuchihashi, Genichi; Ogura, Katsuyuki; Sakoda, Ryozo; Hashiba, Isao; and Fukushima, Shuichi, 4,242,522, Cl. 560-47.000.
Sage, Jay P.: *See—*
Cappon, Arthur M.; Collins, John D.; and Sage, Jay P., 4,242,683, Cl. 343-7.700.
Sagou, Masakazu: *See—*
Iwahashi, Shunji; Yamasaki, Masahiro; and Sagou, Masakazu, 4,242,413, Cl. 428-412.000.
Saiki, Noritsugu: *See—*
Segawa, Yasuhiko; and Saiki, Noritsugu, 4,242,398, Cl. 428-172.000.
Saint-Firmin, Annette R. Embryogenesis in vitro, induction of qualitative and quantitative changes in metabolites produced by plants and products thereof. 4,241,536, Cl. 47-58.000.
St. Germain, Dennis, to I & I Sling Company, Inc. Chain saddle assembly. 4,241,575, Cl. 59-93.000.
Saito, Kunio: *See—*
Tsujiyama, Bunjiro; Saito, Kunio; and Kurihara, Kenji, 4,242,662, Cl. 340-146.3QH.
Saito, Mitsuo, to Fuji Photo Film Co., Ltd. Method for preparing light-sensitive silver halide grains. 4,242,445, Cl. 430-569.000.
Saito, Takeshi: *See—*
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao;

Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.
Sakae, Mitsuhisa: *See*—
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Sakai, Kiyoshi: *See*—
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, 4,242,260, Cl. 260-160.000.
Sakakibara, Hideo; Okegawa, Osamu; Watanabe, Toshiyuki; Fujiwara, Tatsuro; Watanabe, Susumu; Omura, Satoshi; and Matsuda, Tetsuo, to Toyo Jozo Kabushiki Kaisha. 3''-Acylated macrolide antibiotics. 4,242,504, Cl. 536-17.00R.
Sakamoto, Eiichi: *See*—
Habu, Teiji; Ishihara, Masao; Terada, Sadatugu; Sakamoto, Eiichi; and Yamada, Hiroshi, 4,242,444, Cl. 430-510.000.
Sakashita, Kiichiro: *See*—
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Sakiyama, Kazuo: *See*—
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Sakoda, Ryozo: *See*—
Tsuchihashi, Genichi; Ogura, Katsuyuki; Sakoda, Ryozo; Hashiba, Isao; and Fukushima, Shuichi, 4,242,522, Cl. 560-47.000.
Sakurai, Hideo: *See*—
Fujii, Masaki; Goto, Shiro; and Sakurai, Hideo, 4,242,229, Cl. 252-429.00B.
Salem, Robert J., to General Electric Company. Intrusion detection method and apparatus. 4,242,743, Cl. 367-93.000.
Salger, Werner, to Lumoprint Zindler KG (GmbH & Co.). Electrostatic developing apparatus including powder propelling means. 4,241,695, Cl. 118-658.000.
Saluja, Kulbir: *See*—
Babcock, Bryce W.; Reynolds, Mark P.; and Saluja, Kulbir, 4,241,819, Cl. 192-70.270.
Salvarezza, Robert M. Rope ladder with molded hard elastomer steps and a method for assembly of the same. 4,241,809, Cl. 182-199.000.
Salvatore, Costanzo. Machine for punching, nibbling, rounding off and cutting any kind of sheets or plates, and for similar operations. 4,241,631, Cl. 83-411.00R.
Samoil, Iacob: *See*—
Popovici, Neculai; Dochia, Mihail; Dumitrescu, Mihai; Spirea, Iosif; and Samoil, Iacob, 4,242,308, Cl. 422-195.000.
Sandoz Ltd.: *See*—
Mauric, Claudine; and Wolf, Rainer, 4,242,138, Cl. 106-18.180.
Sanford, Gary G., to Ball Corporation. Slotted cavity antenna. 4,242,685, Cl. 343-770.000.
Sanguino-Alvarez, Guillermo: *See*—
Matyl, Franz; Klecker, Johann; and Sanguino-Alvarez, Guillermo, 4,241,593, Cl. 64-14.000.
Sanok, John L.; and Reilly, Albert F., to Sheller-Globe Corporation. Color stable integral skin foam. 4,242,463, Cl. 521-51.000.
Sansregret, Joseph L., to Exxon Research & Engineering Co. Process for thin film deposition of metal and mixed metal chalcogenides displaying semi-conductor properties. 4,242,374, Cl. 427-76.000.
Santana, Manuel R.: *See*—
Gagen, Paul F.; and Santana, Manuel R., 4,241,979, Cl. 350-96.230.
Santini, Hugo A. E.; and Wick, David P., to International Business Machines Corporation. Wafer orienting apparatus. 4,242,038, Cl. 414-755.000.
Sargent & Greenleaf, Inc.: *See*—
Miller, Harry C.; and Evans, Walter R., 4,241,594, Cl. 70-38.00A.
Sasaki, Hideki. Dental prosthesis. 4,242,089, Cl. 433-189.000.
Sasaki, Masaomi; Sakai, Kiyoshi; Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, to Ricoh Company, Ltd. 2-Hydroxy-3-carbonylanilinonaphth-1-yl disazo derivatives and 1-phenyl-3-methyl-5-hydroxypyrazol-4-yl disazo derivatives of 1,4-bis(4-aminostyryl) benzene. 4,242,260, Cl. 260-160.000.
Sasaki, Noriaki: *See*—
Kawaguchi, Takeyuki; Taketani, Yutaka; Minematsu, Hiroyoshi; Sasaki, Noriaki; Hayashi, Yuzuru; and Hara, Shigeyoshi, 4,242,208, Cl. 210-500.200.
Sasaki, Norio: *See*—
Tanaka, Morihisa; Konno, Kazuhiko; Sasaki, Norio; and Uchimura, Kunio, 4,242,277, Cl. 260-396.000.
Sasaki, Toshio: *See*—
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.
Sata, Tekeo; Takamura, Masayuki; Yamagishi, Tomoo; Hoshi, Toshiharu; and Iijima, Kenzaburo, to Nippon Gakki Seizo Kabushiki Kaisha. Multilayer magnetic head core. 4,242,711, Cl. 360-126.000.
Sato, Gentaku. Waste disposal method using microwaves. 4,242,220, Cl. 252-301.10W.
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Apparatus for electrical discharge machining of cylindrical work. 4,242,557, Cl. 219-69.00E.
Sato, Kunihiko: *See*—
Nonoyama, Takao; and Sato, Kunihiko, 4,241,751, Cl. 137-103.000.
Sato, Masamichi, to Fuji Photo Film Co., Ltd. Photomask material. 4,242,438, Cl. 430-278.000.
Satomoto, Atsushi, to Aisin Seiki Kabushiki Kaisha. Temperature responsive valve device. 4,241,873, Cl. 236-87.000.
Saunders, Arthur G.: *See*—
Snellman, Donald L.; Lewis, Barry J.; Saunders, Arthur G.; and Hester, Wesley W., 4,242,174, Cl. 156-563.000.
Savoy, Paul D.: *See*—
Pellon, Joseph J.; and Savoy, Paul D., 4,242,247, Cl. 260-29.6WQ.
Scallet, Barrett L.: *See*—
Ehrenthal Irving; Shieh, Kenneth K.; Scallet, Barrett L.; and Rajpara, Jagdish, 4,242,451, Cl. 435-94.000.
Schabert, Hans-Peter: *See*—
Meintker, Manfred; Puthawala, Anwer; Schabert, Hans-Peter; and Strickroth, Erich, 4,242,001, Cl. 366-75.000.
Schal, Wilfried: *See*—
Schindler, Johannes G.; and Schal, Wilfried, 4,242,191, Cl. 204-195.00M.
Schalk, Karl; and Kogler, Georg, to Siemens Aktiengesellschaft. Direct current stepper motor with a permanent magnet rotor and electronic commutation device. 4,242,624, Cl. 318-696.000.
Scheer, Erich, to Kundo - Kieninger & Obergfell. Electric alarm clock. 4,242,748, Cl. 368-244.000.
Scheinost, Kurt: *See*—
Buchreiter, Georg; Kniep, Peter; Scheinost, Kurt; and Vollbrecht, Heinz-Rudiger, 4,242,319, Cl. 423-383.000.
Schellmann, Klaus; and Schulze, Heinz, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Device for adjusting the ignition time in internal combustion engines. 4,241,709, Cl. 123-407.000.
Scherer, Fred F. Sawbuck. 4,241,772, Cl. 269-289.00R.
Schertler, Siegfried, to Vat Aktiengesellschaft fuer Vakuum-Apparate Technik. Pneumatic actuator. 4,241,644, Cl. 91-447.000.
Schick, Ludwig: *See*—
Glaser, Helmut; and Schick, Ludwig, 4,242,638, Cl. 328-144.000.
Schiff, Norman: *See*—
Bourdelle, Peter A.; and Schiff, Norman, 4,241,828, Cl. 206-306.000.
Schilling, Bernd, to Consortium fur Elektrochemische Industrie GmbH. Process for the manufacture of β-isobutyrylaminocrotonic acid amide. 4,242,276, Cl. 564-159.000.
Schilling, Curtis L., Jr.; and Eschbach, C. Scott, to Union Carbide Corporation. Polyurethanes and their preparation. 4,242,466, Cl. 521-112.000.
Schilling, Walter: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,242,264, Cl. 260-326.00C.
Schiminski, Herbert: *See*—
Turk, Herbert; and Schiminski, Herbert, 4,241,571, Cl. 57-58.890.
Turk, Herbert; and Schiminski, Herbert, 4,241,574, Cl. 57-200.000.
Schindler, Johannes G.; and Schal, Wilfried, to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Apparatebau KG. Ion selective sensor and method of making such sensor. 4,242,191, Cl. 204-195.00M.
Schlecht, Helmut; Weberndoerfer, Volkmar; and Widder, Rudi, to BASF Aktiengesellschaft. Preparation of alkanes substituted by chlorine atoms and/or sulfochloride groups. 4,242,187, Cl. 204-162.0SH.
Schlegel Corporation: *See*—
Yackiw, Charles, 4,242,392, Cl. 428-85.000.
Schlinger, Warren G.; and Slater, William L., to Texaco Inc. Catalyst for conversion of hydrogen and carbon monoxide into C_1–C_4 range hydrocarbons. 4,242,234, Cl. 252-439.000.
Schlotterer, Gustav: *See*—
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Schlumberger Technology Corporation: *See*—
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Schmahl, Manfred: *See*—
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Schmelzer Corporation: *See*—
Detweiler, Charles A., 4,241,711, Cl. 123-559.000.
Schmid, Karlheinz, to Gebrueder Heller, Maschinenfabrik GmbH. Milling tool, especially gang cutter. 4,242,020, Cl. 409-234.000.
Schmidt, Jakob E. Brassiere having simulated nipples and attachable-detachable nipple simulators. 4,241,737, Cl. 128-42[illegible]000.
Schmidt, Paul: *See*—
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Schmitt, Frederick L.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,242,269, Cl. 260-345.100.
Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,242,281, Cl. 568-458.000.
Schmitt, Gilles M.-J. B.: *See*—
Caruel, Jacques E. J.; Stora, Guy D.; and Schmitt, Gilles M.-J. B., 4,241,586, Cl. 60-738.000.
Schmitt, Joseph M.; and Quinn, Richard J., to CY/RO Industries. Controlling grafted elastomers in blends with resinous copolymers. 4,242,469, Cl. 525-71.000.
Schmitz, Floyd A., to J. I. Case Company. Quick-release coupling. 4,242,034, Cl. 414-686.000.
Schmitz, Friedrich: *See*—
Bergmann, Klaus; Schmitz, Friedrich; Kilian, Gottfried; and Reppel, Heinz, 4,242,144, Cl. 106-281.00R.
Schnabel, Peter W.; Chernack, Milton P.; Wilkes, Lawrence T.; and Perry, Gordon R., to Noxell Corporation. Adjustable wiper container and applicator assembly for cosmetics and the like. 4,241,743, Cl. 132-88.700.

Schneider, Abraham; and Myers, Harry K., Jr., to Sun Oil Company of Pennsylvania. Hydrogenolysis of 2,5-norbornadiene saturated endo-endo hexacyclic dimer. 4,242,529, Cl. 585-353.000.
Schoenfelder, James L. Heat storage system adapted for incongruently melting heat storage materials and congruently melting heat storage materials. 4,241,782, Cl. 165-10.000.
Scholz, Manfred; and Kaiser, Karl, to Hoechst Aktiengesellschaft. Process and apparatus for drying chlorinated polymers. 4,241,514, Cl. 34-17.000.
Schonfelder, Manfred: *See—*
Konig, Eberhard; Schonfelder, Manfred; and Pedain, Josef, 4,242,410, Cl. 428-315.000.
Schoon, David J., to Minnesota Mining and Manufacturing Company. Thermal print head. 4,242,565, Cl. 219-216.000.
Schossow, George W. Heat exchanger. 4,241,874, Cl. 237-55.000.
Schreffler, John R.: *See—*
Cheng, Tai C.; and Schreffler, John R., 4,242,493, Cl. 528-168.000.
Schroder, Georg. Vehicle with transformable loading area. 4,241,947, Cl. 296-10.000.
Schroeder, John O., to RCA Corporation. Pulse modulator for operating a device in the avalanche mode. 4,242,644, Cl. 330-297.000.
Schuder, Maurice E.; and Stafford, Richard W., to Emhart Industries, Inc. Timing mechanism with two separate programs operating separate switch actuators and having an alarm system. 4,242,746, Cl. 368-109.000.
Schulte, Klaus: *See—*
Kreuer, Karl D.; and Schulte, Klaus, 4,242,306, Cl. 422-133.000.
Schulze, Heinz: *See—*
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Schumacher, Bernd: *See—*
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Schupp, Heribert: *See—*
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Schurfeld, Horst, to Gildemeister-Devlieg System-Werkzeuge GmbH. Boring tool. 4,242,018, Cl. 408-182.000.
Schuster, Hans-Joachim: *See—*
Heppner, Klaus-Dieter; and Schuster, Hans-Joachim, 4,242,180, Cl. 204-43.00N.
Schwarz, Frederick M., to United Technologies Corporation. Temperature control of engine case for clearance control. 4,242,042, Cl. 415-116.000.
Schwarz, Hans: *See—*
Moller, Wolfgang; and Schwarz, Hans, 4,241,958, Cl. 308-160.000.
Schweiger, Richard G. Cross-linking of cellulose sulfate esters with tetravalent metal ions. 4,242,506, Cl. 536-59.000.
Schweitzer, Hans E., to H. E. Schweitzer AG. Multiple-switch arrangement. 4,242,544, Cl. 200-5.00E.
Schweitzer, Hans E., to H. E. Schweitzer AG. Mechanical switch. 4,242,545, Cl. 200-5.00R.
Schweitzer, Klaus: *See—*
Huther, Werner; Schweitzer, Klaus; and Rossmann, Axel, 4,242,294, Cl. 264-62.000.
Schwellinger, Ulrich; and Lenz, Rudiger, to Messerschmitt-Bolkow-Blohm GmbH. Method for increasing the hit probability of jammed missiles and device for carrying out the method. 4,241,889, Cl. 244-3.150.
Scribner, Albert W., to Pitney Bowes Inc. Heat-pressure fusing device. 4,242,566, Cl. 219-216.000.
Sears Manufacturing Co.: *See—*
Koutsky, Louis J.; and Breitmeyer, Alexander M., 4,241,893, Cl. 248-425.000.
Sedgeley, Lawrence R.: *See—*
Hopfe, Harold H.; Mosher, Robert H.; and Sedgeley, Lawrence R., 4,241,691, Cl. 118-126.000.
Seelbach, Walter C., to Motorola, Inc. Transient array drive for bipolar ROM/PROM. 4,242,605, Cl. 307-270.000.
Seelenbinder, Terry G.: *See—*
Jackson, Richard W.; and Seelenbinder, Terry G., 4,241,989, Cl. 354-299.000.
Seely, Donald G.: *See—*
Nelson, Hollis E.; and Seely, Donald G., 4,242,078, Cl. 431-45.000.
Segawa, Yasuhiko; and Saiki, Noritsugu, to Teijin Limited. Fibrous shaped article having non-level surface. 4,242,398, Cl. 428-172.000.
Segerstrom, Lars H., to Imo-Industri Aktiebolag. Hydraulic screw machine with balance plunger. 4,242,067, Cl. 418-203.000.
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Seipos, Andrew G.: *See—*
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Irvin, Robert A., 4,242,632, Cl. 324-73.00R.
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Alberghini, Alfred C., 4,241,839, Cl. 215-100.00R.
Sexton, Joe F., to Texas Instruments Incorporated. Calculator-printer interface with numerical string segmentation. 4,242,735, Cl. 364-900.000.
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Berthold, Joseph E.; Hartman, Adrian R.; and Shackle, Peter W., 4,242,697, Cl. 357-49.000.
Shah, Naresh R.; Shook, Edgar G.; and Van Cleve, Russell, to Union Carbide Corporation. Polymer/polyol compositions containing vinylidene chloride. 4,242,476, Cl. 526-71.000.
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Defibaugh, George R.; Shannon, Suel G.; and Swengel, Robert C., Jr., 4,242,535, Cl. 174-88.00R.
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Sharpe, Robert; and Szelke, Michael. Synthesis of peptide analogues. 4,242,256, Cl. 260-112.50R.
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Shaw, Julius. Insulating material and process for manufacturing same. 4,242,165, Cl. 156-313.000.
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Davies, David R.; and Richardson, Edwin A., 4,241,791, Cl. 166-292.000.
Gergen, William P.; and Davison, Sol, 4,242,470, Cl. 525-92.000.
Parrish, John F., 4,242,741, Cl. 367-21.000.
Powell, James E., 4,242,521, Cl. 560-35.000.
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,242,279, Cl. 568-303.000.
Sheller-Globe Corporation: *See—*
Sanok, John L.; and Reilly, Albert F., 4,242,463, Cl. 521-51.000.
Shelter Insulation, Inc.: *See—*
Parker, Lawrence J., 4,242,409, Cl. 428-297.000.
Shepard, Francis H., Jr., to R & I Patent Corporation. Stabilized nonlinear servomechanism. 4,242,622, Cl. 318-616.000.
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Shevels, Thomas F.: *See—*
Harris, Norman; and Shevels, Thomas F., 4,242,284, Cl. 568-454.000.
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Nakamura, Shigeru; and Shimamura, Isao, 4,242,441, Cl. 430-390.000.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi; and Fujimoto, Hideaki, 4,241,617, Cl. 474-82.000.
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Green, Sidney J.; Shipman, Floyd H.; and Van Kempen, Carl J. H. B., 4,241,796, Cl. 175-24.000.

Shiraishi Central Laboratories Co., Ltd.: *See—*
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Shircliffe, Donald F., to VBM Corporation. Vehicle lift assembly and control system therefor. 4,241,901, Cl. 254-89.00H.

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Yajima, Seishi; Okamura, Kiyohito; Shishido, Toetsu; and Hasegawa, Yoshio, 4,242,487, Cl. 528-25.000.

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Batjukov, Vladimir I.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Shkhian, Tsolak G.; and Sumatokhin, Vitold A., 4,242,178, Cl. 176-30.000.

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Yokota, Yoshihisa; Hosokawa, Teruo; and Sakashita, Kiichiro, 4,242,479, Cl. 526-124.000.

Shuey, Kenneth C., to Westinghouse Electric Corp. DC Switching voltage regulator with extended input voltage capability. 4,242,629, Cl. 323-17.000.

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Sidebottom, Thomas O.: *See—*
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Siebeneick, Hans U.: *See—*
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Siemens Aktiengesellschaft: *See—*
Bergman, Ola, 4,241,802, Cl. 178-3.000.
Edinger, Egon; and Przybylski, Zdzislaw, 4,241,570, Cl. 57-1.0UN.
Finck, Herbert; and Reisinger, Konrad, 4,242,750, Cl. 371-22.000.
Glaser, Helmut; and Schick, Ludwig, 4,242,638, Cl. 328-144.000.
Heppner, Klaus-Dieter; and Schuster, Hans-Joachim, 4,242,180, Cl. 204-43.00N.
Herkert, Hans, 4,242,752, Cl. 371-37.000.
Heyneman, Guido; Vandenbossche, Christiaan; and Thieme, Roland, 4,242,301, Cl. 422-68.000.
Hoffmann, Kurt; and Mauthe, Manfred, 4,242,600, Cl. 307-221.00D.
Knauer, Karl, 4,242,654, Cl. 333-165.000.
Kobale, Manfred; and Wengert, Rolf, 4,242,372, Cl. 427-68.000.
Kunze, Karl, 4,242,558, Cl. 219-69.00W.
Marsing, Helmut, 4,242,534, Cl. 174-15.00S.
Meusburger, Guenther; Knauer, Karl; and Tihanyi, Jenoe, 4,242,603, Cl. 307-238.000.
Roemer, Hans; and Steil, Klaus-Peter, 4,242,559, Cl. 219-69.00W.
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Rudenauer, Werner; and Siewert, Ralf, 4,241,662, Cl. 102-210.000.

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Muller, Werner; and Heinzer, Hans, 4,241,563, Cl. 53-511.000.

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Silk, John K.; Krieger, Allen S.; and Huang, Eugene W. C., to American Science and Engineering, Inc. X-ray lithography system having collimating optics. 4,242,588, Cl. 250-492.00A.

Silver, Alexander: *See—*
McCarty, Frederick B.; and Silver, Alexander, 4,242,610, Cl. 310-156.000.

Silver, Spencer F.: *See—*
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Silvestri, George J., Jr., to Westinghouse Electric Corp. Rotor cooling for double axial flow turbines. 4,242,041, Cl. 415-115.000.

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Manankov, Mikhail K., 4,242,120, Cl. 71-89.000.

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Simonsson, Leif R.: *See—*
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Simpson, Douglass E. Folding chair. 4,241,950, Cl. 297-18.000.

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Van Cleve, Russell; Armstrong, George H.; and Simroth, Donald W., 4,242,249, Cl. 260-33.20R.

Sinclair, David P., to Standard Oil Company (Indiana). Sulfamic acid as a catalyst for the polymerization of chlorocyclophosphazenes. 4,242,316, Cl. 423-300.000.

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Singer Company, The: *See—*
Du Bois, Edward F., 4,241,497, Cl. 29-839.000.
Hunts, Barney D., 4,242,667, Cl. 340-365.00R.
Iannarone, Ronald C., 4,241,472, Cl. 16-115.000.
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Peterson, Wesley R.; and Lang, Douglas C., 4,241,961, Cl. 312-22.000.
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Nurk, Siegfried, 4,241,478, Cl. 26-18.500.

Siren, Matti J. Filter material and a method of manufacturing and using the same. 4,242,226, Cl. 252-422.000.

Skarfelt, Hans T.: *See—*
Hulten, Bengt H.; Skarfelt, Hans T.; and Gjertz, Uno L., 4,242,161, Cl. 156-197.000.

SKF Industrial Trading & Development Co. B.V.: *See—*
Hentschel, Georg, 4,241,960, Cl. 308-237.00R.

Skinner, Harry W. Gasket for sealing a pipe in a porthole. 4,242,164, Cl. 156-304.100.

SKW Trostberg Aktiengesellschaft: *See—*
Buchreiter, Georg; Kniep, Peter; Scheinost, Kurt; and Vollbrecht, Heinz-Rudiger, 4,242,319, Cl. 423-383.000.
Freissmuth, Alfred, 4,242,126, Cl. 75-51.000.

Slaght, William F., to Canada, Her Majesty the Queen in right of. Remotely operated placement equipment. 4,242,036, Cl. 414-737.000.

Slater, William L.: *See—*
Schlinger, Warren G.; and Slater, William L., 4,242,234, Cl. 252-439.000.

Slattery, Ian: *See—*
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Sloan Valve Company: *See—*
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Sloane, Glenn L. Removably mounted truck binding post. 4,242,021, Cl. 410-96.000.

Slobodin, Leo, to Lockheed Electronics Corporation. Electronic identification system. 4,242,663, Cl. 340-152.00T.

Smedlund, Kurt H. Device for obtaining coordinated movements of operative members incorporated in a machine or a plant. 4,241,652, Cl. 100-49.000.

Smid, Jacob K.; and Aalbers, Johan G., to Chem-y, Fabriek Van Chemische Produkten B.V. Substantially environmental-pollution-free laundry detergent composition. 4,242,215, Cl. 252-100.000.

Smirl, Richard L., to Borg-Warner Corporation. Variable pulley transmission. 4,241,618, Cl. 74-863.000.

Smirlock, Martin E.: *See—*
Smith, Donald A.; and Smirlock, Martin E., 4,241,673, Cl. 110-347.000.

Smith, Andrew L.; and Claes, Paul E., to E M I Limited. Magnetically structured materials. 4,242,400, Cl. 428-201.000.

Smith, Dale E.: *See—*
Pinter, Warren H.; and Smith, Dale E., 4,242,160, Cl. 156-175.000.

Smith, Donald A.; and Smirlock, Martin E., to Combustion Engineering, Inc. Direct ignition of pulverized coal. 4,241,673, Cl. 110-347.000.

Smith, Frederick J., to National Semiconductor Corporation. MOS Input circuit with selectable stabilized trip voltage. 4,242,604, Cl. 307-251.000.

Smith, Gary R., to Smith R. P. M. Corporation. Self-cleaning nozzle for lithographic printing dampeners. 4,241,656, Cl. 101-148.000.

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Smith, Lawrence A., Jr., to Chemical Research & Licensing Company. Process for separating isobutene from C_4 streams. 4,242,530, Cl. 585-510.000.

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Smith, Warren F., Jr.: *See—*
Shapiro, Eugene; Vitek, John M.; and Smith, Warren F., Jr., 4,242,131, Cl. 75-157.500.
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Smith, William A., to Rockwell International Corporation. Heating and cooling system. 4,241,783, Cl. 165-48.00R.

Smith, William V. Photosensitive alarm systems. 4,242,670, Cl. 340-568.000.

SmithKline Corporation: *See—*
DeMarinis, Robert M., 4,242,346, Cl. 424-258.000.

Snamprogetti S.p.A.: *See—*
Bartoli, Francesco; Morisi, Franco; and Zaccardelli, Delio, 4,242,461, Cl. 435-288.000.

Snell, George J., to Lummus Company, The. Production of gasified products from ash containing bitumen produced in coal liquefaction. 4,242,102, Cl. 48-197.00R.
Snellman, Donald L.; Lewis, Barry J.; Saunders, Arthur G.; and Hester, Wesley W. Sheet binding system. 4,242,174, Cl. 156-563.000.
Snow Brand Milk Products Co., Ltd.: *See—*
Honda, Yoshihiko; Koutake, Masanobu; Kanazawa, Hidege; Iwasaki, Taisuke; Ohba, Shozo; Hashiba, Honoh; and Kawanishi, Gosei, 4,242,450, Cl. 435-69.000.
Snow, Thomas G., to Owens-Illinois, Inc. Hand tool for opening ampuls. 4,241,627, Cl. 81-3.46R.
Snyder, Wesley L. Anti-surge liquid transporting apparatus. 4,241,755, Cl. 137-899.000.
Societe Alsacienne de Constructions Mechaniques de Mulhouse: *See—*
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Societe Anonyme Dite: Compagnie Generale d'Electricite: *See—*
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Societe de Recherches Industrielles (Sori): *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
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Somerville, Daniel W., to Dennison Manufacturing Company. Variable size character generation using neighborhood-derived shapes. 4,242,678, Cl. 340-728.000.
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Ebihara, Norio, 4,242,705, Cl. 358-167.000.
Hagiwara, Yoshiaki, 4,242,692, Cl. 357-24.000.
Kusaka, Satoshi; and Shino, Kuninori, 4,241,926, Cl. 274-23.00R.
Nakamura, Tadahiko; and Nakano, Kenji, 4,242,619, Cl. 318-314.000.
Yoshida, Susumu; Ishigaki, Yoshio; and Nagai, Tamiji, 4,242,714, Cl. 361-152.000.
Sorenson, Richard W., to Carlingswitch, Inc. Environmentally sealed rocker switch. 4,242,551, Cl. 200-302.000.
Sparks, Moses, Jr.: *See—*
Leib, Ronald J.; and Sparks, Moses, Jr., 4,242,394, Cl. 428-95.000.
Spaulding, Carl P. Programmable limit switch for a movable member, particularly a machine tool slide. 4,242,621, Cl. 318-601.000.
Specht, Donald F.; and Dow, Julian, to Smith Kline Instruments, Inc. Ultrasonic diagnostic transducer assembly and system. 4,241,611, Cl. 73-626.000.
Spector, George: *See—*
Arends, Andrew; Arends, Gary W.; and Spector, George, 4,242,111, Cl. 55-269.000.
Speer, Eugene M. Personal protective device. 4,241,850, Cl. 222-39.000.
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Spencer Wright Industries, Inc.: *See—*
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Parsons, Ronald; and Slattery, Ian, 4,241,676, Cl. 112-79.00A.
Sperry Corporation: *See—*
Bean, Donald E., 4,242,640, Cl. 328-187.000.
Ostergren, William F., 4,241,879, Cl. 239-677.000.
Webster, E. Graham, 4,241,566, Cl. 56-14.600.
Spevack, Jerome S., to Deuterium Corporation. Apparatus for controlling emissions of hydrogen sulfide from a system utilizing geothermal steam. 4,242,305, Cl. 422-129.000.
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Popovici, Neculai; Dochia, Mihail; Dumitrescu, Mihai; Spirea, Iosif; and Samoil, Iacob, 4,242,308, Cl. 422-195 000.
Spoeth, Carl R., Jr., to Dart Industries Inc. Detachable handle assembly. 4,241,946, Cl. 294-31.00R.
Sprague Electric Company: *See—*
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Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivatives, processes for preparing same and organoleptic uses thereof. 4,242,269, Cl. 260-345.100.
Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Process for preparing 6-hydroxy-2,6-dimethylheptanal and intermediates thereof. 4,242,281, Cl. 568-458.000.
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Squibbs, John D., to Ford Motor Company. Method of controlling exhaust gas emissions from an electric arc furnace. 4,242,532, Cl. 13-34.000.
Stache, Ulrich; Fritsch, Werner; and Alpermann, Hans G., to Hoechst Aktiengesellschaft. Corticoid 17-(alkyl carbonates) and processes for their preparation. 4,242,334, Cl. 424-243.000.
Staeubli Ltd.: *See—*
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Ginsburgh, Irwin, 4,241,952, Cl. 299-2.000.
Hanson, Joseph B., 4,242,212, Cl. 252-51.50R.
Partenheimer, Walter, 4,242,128, Cl. 75-109.000.
Sinclair, David P., 4,242,316, Cl. 423-300.000.
Stanifer, Charles D.: *See—*
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Stanley, Henry; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Modified polyurethane adhesive compositions containing a carbamate ester additive useful in laminating substrates. 4,242,488, Cl. 428-423.100.
Stanley Works, The: *See—*
Ambler, E. Curtis, 4,241,634, Cl. 83-763.000.
Stapp, Paul R., to Phillips Petroleum Company. Catalysts for conversion of conjugated diolefins to diacyloxy olefins. 4,242,228, Cl. 252-429.00R.
Starke, Klaus: *See—*
Vogel, Hans-Henning; Oppenlaender, Knut; and Starke, Klaus, 4,242,101, Cl. 44-58.000.
Stauffer Chemical Company: *See—*
Weil, Edward D., 4,242,288, Cl. 260-929.000.
Steadman, Rufus P. Elevated light system. 4,242,726, Cl. 362-418.000.
Stehl, Rudolph H.: *See—*
Nestrick, Terry J.; and Stehl, Rudolph H., 4,242,227, Cl. 252-428.000.
Steil, Klaus-Peter: *See—*
Roemer, Hans; and Steil, Klaus-Peter, 4,242,559, Cl. 219-69.00W.
Steinbach, Joachim: *See—*
Feess, Erich; Birke, Walter; and Steinbach, Joachim, 4,242,091, Cl. 8-444.000.
Steiner, Eginhard: *See—*
Martin, Pierre; Greuter, Hans; Steiner, Eginhard; and Bellus, Daniel, 4,242,278, Cl. 568-341.000.
Steiner, Rudolf; and Kaufmann, Raimund. Apparatus for spectroscopic measurement of the velocity of particles in a fluid. 4,242,194, Cl. 204-299.00R.
Stendel, Wilhelm: *See—*
Fuchs, Rainer A.; Hammann, Ingeborg; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,242,357, Cl. 424-282.000.
Stenemann, Heinrich F., to Minnesota Mining and Manufacturing Company. Pavement-marking tape application apparatus. 4,242,173, Cl. 156-523.000.
Stenuick Freres S.A.: *See—*
Stenuick, Pierre, 4,241,800, Cl. 175-400.000.
Stenuick, Pierre, to Stenuick Freres S.A. Cutting tool for a pneumatic hammer. 4,241,800, Cl. 175-400.000.
Stephens, James B.; and Miller, Charles G., to TDV Co. By-pass water softener system and installation. 4,242,201, Cl. 210-240.000.
Sternenberg, James E.; and Broadway, William W., to FMC Corporation. Annular resilient metal valve seat. 4,241,895, Cl. 251-173.000.
Sterr, Gerhard, to Varta Batterie, Aktiengesellschaft. Method for improving wettability of high temperature cell separators. 4,242,427, Cl. 429-247.000.
Stevanovich, Srbo M.: *See—*
Garver, Richard F.; and Stevanovich, Srbo M., 4,242,070, Cl. 425-28.00B.
Stewart, Charles G., to Dunlop Limited. Tire and wheel assemblies. 4,241,776, Cl. 152-381.400.
Stewart, David G.: *See—*
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,242,233, Cl. 252-431.00N.
Stifelsen Institutet for Mikrovagsteknik Vid Tekniska Hogskolan i Stockholm: *See—*
Henoch, Bengt T.; and Berglind, Eilert, 4,242,661, Cl. 340-23.000.
Stigebrandt, Ake. Apparatus for separation of material suspended in liquids. 4,242,204, Cl. 210-326.000.
Stinton, Frederick M., to Martin Concrete Engineering Company. Concrete railroad tie casting and handling system. 4,242,071, Cl. 425-111.000.
Stirling, Irene, to Beecham Group Limited. 9-Nitromethyldeoxyclavulanic acid derivatives preparation and compositions. 4,242,262, Cl. 260-245.300.
Stoelting, Inc.: *See—*
Martineau, Tom N., 4,241,590, Cl. 62-343.000.
Stone, Richard H., to National Semiconductor Corporation. Method for adjusting the focus and power of a trimming laser. 4,242,152, Cl. 148-9.500.
Stone, Wilfred S. Disposable floating flashlight. 4,242,724, Cl. 362-158.000.

Stora, Guy D.: *See—*
Caruel, Jacques E. J.; Stora, Guy D.; and Schmitt, Gilles M.-J. B., 4,241,586, Cl. 60-738.000.

Storni, Angelo: *See—*
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,242,264, Cl. 260-326.00C.

Stratmann, Josef; and Brinkmann, Willi, to Carl Still, Firma. Apparatus for charging coke oven furnaces of a coke oven battery. 4,242,027, Cl. 414-148.000.

Stricker, Klaus F. Strip media drive system. 4,242,709, Cl. 360-96.400.

Strickroth, Erich: *See—*
Meintker, Manfred; Puthawala, Anwer; Schabert, Hans-Peter; and Strickroth, Erich, 4,242,001, Cl. 366-75.000.

Stringer, Frederick D.: *See—*
Dacey, Raymond B.; and Stringer, Frederick D., 4,242,297, Cl. 264-230.000.

Strojny, Werner, to August Ruggeberg, Firma. Edge sharpener. 4,241,624, Cl. 76-83.000.

Studt, William L.: *See—*
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,337, Cl. 424-248.540.
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,338, Cl. 424-248.540.
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,339, Cl. 424-248.540.
Douglas, George H.; Studt, William L.; and Dodson, Stuart A., 4,242,340, Cl. 424-248.540.

Sugano, Kenji: *See—*
Numata, Masayuki; and Sugano, Kenji, 4,242,365, Cl. 426-438.000.

Sugawara, Yutaka; Yamamoto, Akihiro; Handa, Mitsuaki; Usami, Hiroko; and Ogawa, Haruki, to Chugai Seiyaku Kabushiki Kaisha. Anti-tumor substance and process for preparing the same. 4,242,326, Cl. 424-116.000.

Suggitt, Robert M.: *See—*
Child, Edward T.; and Suggitt, Robert M., 4,242,458, Cl. 435-247.000.

Sugimoto, Tadahiro. Hydraulic system for controlling saw-frame cutting feed speed in a sawing machine. 4,241,635, Cl. 83-800.000.

Sugiyama, Makoto, to Kaijirushi Hamono Center. Pair of scissors. 4,241,503, Cl. 30-268.000.

Sugiyama, Toshio: *See—*
Ishigaki, Yasuhiro; and Sugiyama, Toshio, 4,242,608, Cl. 310-68.00R.

Sugiyama, Toshitomo: *See—*
Morito, Nobuyuki; Sugiyama, Toshitomo; Yokoyama, Yasuo; and Ichida, Toshio, 4,242,155, Cl. 148-113.000.

Sumatokhin, Vitold A.: *See—*
Batjukov, Vladimir I.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Shkhian, Tsolak G.; and Sumatokhin, Vitold A., 4,242,178, Cl. 176-30.000.

Sumikin Coke Co., Ltd: *See—*
Aiba, Takaaki; Takahashi, Ryoichi; Hosoi, Takuji; and Konno, Tutomu, 4,242,196, Cl. 208-40.000.

Sumitomo Chemical Company, Limited: *See—*
Iwahashi, Shunji; Yamasaki, Masahiro; and Sagou, Masakazu, 4,242,413, Cl. 428-412.000.

Sumitomo Electric Industries, Ltd.: *See—*
Shiraishi, Satoshi; Fujiwara, Kunio; and Kurosaki, Shiro, 4,242,375, Cl. 427-163.000.

Sumitomo Metal Industries, Ltd.: *See—*
Aiba, Takaaki; Takahashi, Ryoichi; Hosoi, Takuji; and Konno, Tutomu, 4,242,196, Cl. 208-40.000.

Sumner, John S. Domical structure composed of symmetric, curved triangular faces. 4,241,550, Cl. 52-81.000.

Sun Chemical Corporation: *See—*
Douma, William L.; and Brigham, Ward E., 4,242,725, Cl. 362-341.000.

Sun Oil Company of Pennsylvania: *See—*
Schneider, Abraham; and Myers, Harry K., Jr., 4,242,529, Cl. 585-353.000.

Sunahara, Kazuo: *See—*
Watanabe, Kiyoshi; Sunahara, Kazuo; and Fujita, Tsutomu, 4,242,373, Cl. 427-74.000.

Suominen, Heikki S. Bag support and dispensing apparatus. 4,241,561, Cl. 53-390.000.

Susaki, Kiyoshi: *See—*
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.

Suverkrop, Don. Convertible articulated crane. 4,241,837, Cl. 212-177.000.

Suykens, Matthieu: *See—*
Vaughan, Warren R.; and Suykens, Matthieu, 4,242,026, Cl. 414-145.000.

Suzuki, Akira; Ishida, Akira; and Oya, Masao, to Nippon Zeon Co., Ltd.; and Kanto Denka Kogyo Co., Ltd. Vinylidene chloride copolymer as a material for production of packaging articles. 4,242,484, Cl. 526-273.000.

Suzuki, Ichiro; Motonami, Masanao; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt system. 4,241,939, Cl. 280-804.000.

Suzuki, Ichiro; Ogawa, Hisashi; and Motonami, Masanao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Passive seatbelt system. 4,241,940, Cl. 280-804.000.

Suzuki, Masayuki; Onuma, Nobuo; Ishizuka, Fumihiko; Hara, Shinichi; Osawa, Akira; and Fukuzawa, Akira, to Mitsubishi Paper Mills, Ltd.; and Mitsubishi Heavy Industries, Ltd. Method for oxidizing malodorous sulfur compounds in kraft cooking liquor. 4,242,177, Cl. 162-17.000.

Suzuki, Nobuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Charge transfer image sensor with antiblooming and exposure control. 4,242,599, Cl. 307-311.000.

Suzuki, Yoshiaki: *See—*
Hara, Hiroshi; and Suzuki, Yoshiaki, 4,242,429, Cl. 430-17.000.
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, 4,242,430, Cl. 430-17.000.
Hara, Hiroshi; Nakamura, Kotaro; and Suzuki, Yoshiaki, 4,242,431, Cl. 430-17.000.

Swearingen, Judson S., to Rotoflow Corporation. Thrust adjusting means for nozzle clamp ring. 4,242,040, Cl. 415-113.000.

Swengel, Robert C., Jr.: *See—*
Defibaugh, George R.; Shannon, Suel G.; and Swengel, Robert C., Jr., 4,242,535, Cl. 174-88.00R.

Swift, Robert A.: *See—*
Golias, Tipton; Butts, Gene A.; and Swift, Robert A., 4,242,730, Cl. 364-416.000.

Sylvester, Gerd; Witte, Josef; and Marwede, Gunter, to Bayer Aktiengesellschaft. Catalyst and its preparation and use for the solution polymerization of conjugated dienes. 4,242,232, Cl. 252-429.00C.

Synthelabo: *See—*
Dimsdale, Michael J., 4,242,352, Cl. 424-272.000.
Najer, Henry; and Manoury, Philippe, 4,242,343, Cl. 424-250.000.

Szabo, Ladislas: *See—*
Ayme, Gerard; and Szabo, Ladislas, 4,242,270, Cl. 260-412.800.

Szelke, Michael: *See—*
Sharpe, Robert; and Szelke, Michael, 4,242,256, Cl. 260-112.50R.

Szpakowski, Bronislaw T.; and DeGregorio, Bruno, to Northern Telecom Limited. Ferroresonant voltage regulator incorporating auxiliary winding for large current magnitudes of short duration. 4,242,630, Cl. 323-60.000.

Szvetelszky, Lajos: *See—*
Laky, Janos; Csikos, Rezso; Peterfy, Lajos; Szvetelszky, Lajos; and Pallay, Istvan, 4,242,526, Cl. 568-697.000.

Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Driving system for display. 4,242,681, Cl. 340-785.000.

Tabei, Tohru, to Honeywell Inc. Safety device for gas burners. 4,242,080, Cl. 431-54.000.

Tacchi, Victorio. Arrangements for the transfer of heat from an upper level to a lower level. 4,241,784, Cl. 165-105.000.

Tagawa, Hiroshi; and Kurisu, Kenichiro, to Nishiki Co., Ltd. Diaper cover type garment. 4,241,462, Cl. 2-406.000.

Taig, Alistair G., to Bendix Westinghouse Limited. Power assisted actuating arrangements. 4,241,643, Cl. 91-446.000.

Taihei Industries Co., Ltd.: *See—*
Izumihara, Hiroshi, 4,242,166, Cl. 156-351.000.

Takahama, Akio, to Nippon Kogaku K.K. Apparatus for measuring amount of displacement. 4,241,995, Cl. 356-5.000.

Takahashi, Hiroshi: *See—*
Ito, Yutaka; Yajima, Kazuo; Iwanaga, Yoshiteru; Takahashi, Hiroshi; and Inaba, Masao, 4,242,704, Cl. 358-167.000.

Takahashi, Isao: *See—*
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.

Takahashi, Mitsuo: *See—*
Kawasumi, Yoshio; and Takahashi, Mitsuo, 4,242,376, Cl. 427-216.000.

Takahashi, Ryoichi: *See—*
Aiba, Takaaki; Takahashi, Ryoichi; Hosoi, Takuji; and Konno, Tutomu, 4,242,196, Cl. 208-40.000.

Takahashi, Satomi: *See—*
Yamada, Hideaki; Takahashi, Satomi; and Yoneda, Koji, 4,242,452, Cl. 435-117.000.

Takahashi, Takashi; Katsura, Masaki; Kaneda, Tadao; Hiraki, Hideaki; and Shiratori, Masayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas detecting element. 4,242,303, Cl. 422-98.000.

Takahashi, Yuhachi: *See—*
Aishima, Itsuho; Seki, Junji; Matsumoto, Koichi; Furusawa, Yonemasa; Tsukisaka, Ryogo; and Takahashi, Yuhachi, 4,242,251, Cl. 260-37.60N.

Takamura, Masayuki: *See—*
Sata, Tekeo; Takamura, Masayuki; Yamagishi, Tomoo; Hoshi, Toshiharu; and Iijima, Kenzaburo, 4,242,711, Cl. 360-126.000.

Takamura, Shuichi: *See—*
Osono, Takashi; Oka, Yoshihiko; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; Susaki, Kiyoshi; Takamura, Shuichi; and Miyoshi, Toshiaki, 4,242,449, Cl. 435-48.000.

Takase, Tsutomu: *See—*
Kato, Nobukatu; Takase, Tsutomu; Morimoto, Yoshio; Yuasa, Teruo; and Hattori, Minoru, 4,242,528, Cl. 568-781.000.

Takaya, Masahiro; Yamada, Toshihiro; and Yuizono, Tomokazu, to Morishita Pharmaceutical Co., Ltd. Novel thioamide derivatives containing a pyridazine group. 4,242,512, Cl. 544-239.000.

Takaya, Takao; Masugi, Takashi; Ogino, Takashi; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. Cephalosporin compounds and processes for the preparation thereof. 4,242,510, Cl. 544-27.000.

Takayama, Shuichi: *See—*
Tsuboshima, Kosaku; Takayama, Shuichi; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,242,703, Cl. 358-150.000.

Takematsu, Yoshiyuki, to Fuji Koeki Corporation, a part interest. Photographic flash apparatus. 4,242,616, Cl. 315-241.00P.

Taketani, Yutaka: *See—*
Kawaguchi, Takeyuki; Taketani, Yutaka; Minematsu, Hiroyoshi; Sasaki, Noriaki; Hayashi, Yuzuru; and Hara, Shigeyoshi, 4,242,208, Cl. 210-500.200.

Takeuchi Press Industries Co., Ltd.: *See—*
Fujimori, Hikoichiro, 4,241,657, Cl. 101-211.000.

Takeuchi, Sadatoshi; Iida, Akio; Miyake, Kimio; and Sakae, Mitsuhisa, to Kabushiki Kaisha Komatsu Seisakusho. Noise-proof and air-cooled enclosure for an engine. 4,241,702, Cl. 123-41.700.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Ishizuka, Masaaki, 4,242,453, Cl. 435-123.000.

Takezoe, Fumihiko, to Fuji Electric Co., Ltd. Operating system for a data transmission system. 4,242,749, Cl. 370-85.000.

Tamura, Hiroshi; and Katsube, Masayoshi, to Murata Manufacturing Co., Ltd. Dielectric ceramic compositions based on magnesium, calcium and rare earth metal titanates. 4,242,213, Cl. 106-73.300.

Tanaka, Morihisa; Konno, Kazuhiko; Sasaki, Norio; and Uchimura, Kunio, to Mitsubishi Petrochemical Company, Limited. Nitrosation process. 4,242,277, Cl. 260-396.000.

Tapphorn, Ralph M., to Schlumberger Technology Corporation. Cryostat for borehole sonde employing semiconductor detector. 4,241,592, Cl. 62-514.00R.

Tartakowsky, Michael: *See—*
Aidlin, Stephen H.; and Tartakowsky, Michael, 4,242,033, Cl. 414-662.000.

Tatevosian, Ruben A.: *See—*
Rogov, Viktor F.; Lipatov, Nikolai K.; Tatevosian, Ruben A.; Titov, Mikhail Y.; Tereschenko, Lev A.; and Yakovlev, Arian M., 4,242,141, Cl. 106-89.000.

Taurus Gumiipari Vallalat: *See—*
Antal, Sandor; Bartha, Zoltan; Gorgenyi, Peter; Meitzen, Nandor; and Arvai, Mihaly, 4,241,763, Cl. 138-127.000.

Tauscher, Manfred: *See—*
Brenner, Gunther; Goring, Joachim; Ali Khan, Eskendar; Rohte, Oskar; and Tauscher, Manfred, 4,242,345, Cl. 424-253.000.

Taylor, Clyde L.: *See—*
Fagundes, John L.; and Taylor, Clyde L., 4,241,653, Cl. 100-100.000.

Taylor, James S.: *See—*
Buddemeyer, Bruce D.; Neville, William A.; Taylor, James S.; and Bourne, Richard G., 4,242,364, Cl. 426-98.000.

Taylor, John J., to Mallinckrodt, Inc. Process for the preparation of 2,2-diphenyl-4-(dimethylamino)-pentane nitrile. 4,242,274, Cl. 260-465.00E.

TDV Co.: *See—*
Stephens, James B.; and Miller, Charles G., 4,242,201, Cl. 210-240.000.

Teijin Limited: *See—*
Kawaguchi, Takeyuki; Taketani, Yutaka; Minematsu, Hiroyoshi; Sasaki, Noriaki; Hayashi, Yuzuru; and Hara, Shigeyoshi, 4,242,208, Cl. 210-500.200.
Segawa, Yasuhiko; and Saiki, Noritsugu, 4,242,398, Cl. 428-172.000.

Teledyne Industries, Inc.: *See—*
Karaba, Albert M.; Kauffman, Brian C.; and Bowen, Glen L., 4,241,705, Cl. 123-78.00B.

Temple, Harold E.: *See—*
United States of America, National Aeronautics and Space Administration; Berkman, Samuel; and Temple, Harold E., 4,242,553, Cl. 219-10.49R.

Temple, Victor A. K., to General Electric Company. High breakdown voltage semiconductor device. 4,242,690, Cl. 357-13.000.

Terada, Sadatugu: *See—*
Habu, Teiji; Ishihara, Masao; Terada, Sadatugu; Sakamoto, Eiichi; and Yamada, Hiroshi, 4,242,444, Cl. 430-510.000.

Tereschenko, Lev A.: *See—*
Rogov, Viktor F.; Lipatov, Nikolai K.; Tatevosian, Ruben A.; Titov, Mikhail Y.; Tereschenko, Lev A.; and Yakovlev, Arian M., 4,242,141, Cl. 106-89.000.

Terra Tek, Inc.: *See—*
Green, Sidney J.; Shipman, Floyd H.; and Van Kempen, Carl J. H. B., 4,241,796, Cl. 175-24.000.

Terui, Yohji: *See—*
Koga, Isao; Terui, Yohji; Ohgushi, Masuhito; and Kitahara, Tohru, 4,242,272, Cl. 556-489.000.

Terumo Corporation: *See—*
Shinohara, Isao; Okano, Teruo; and Ikemi, Masahisa, 4,242,474, Cl. 525-404.000.

Texaco Development Corporation: *See—*
Child, Edward T.; and Suggitt, Robert M., 4,242,458, Cl. 435-247.000.
Lambert, Clifford L., Jr., 4,242,214, Cl. 252-75.000.
Zimmerman, Robert L., 4,242,467, Cl. 521-129.000.

Texaco Inc.: *See—*
Schlinger, Warren G.; and Slater, William L., 4,242,234, Cl. 252-439.000.

Texas Alkyls, Inc.: *See—*
Fannin, Loyd W., 4,242,481, Cl. 526-165.000.

Texas Instruments Incorporated: *See—*
Bate, Robert T., 4,242,737, Cl. 365-184.000.
Boone, Gary W.; and Cochran, Michael J., 4,242,675, Cl. 340-711.000.
Ghate, Prabhakar B.; Wilson, Arthur M.; and Fuller, Clyde R., 4,242,698, Cl. 357-71.000.
McCormack, Kent; Robinson, James E.; Knight, Willia n M., Jr.; and Dudley, Dana, 4,242,706, Cl. 358-213.000.
Sexton, Joe F., 4,242,735, Cl. 364-900.000.

Textron Inc.: *See—*
Manning, Harry F., 4,241,489, Cl. 29-408.000.

Th. Goldschmidt Ag: *See—*
Muller, Wolfgang; and Witzke, Lothar, 4,242,127, Cl. 75-99.000.

Thermo Electric Co., Inc.: *See—*
Remmert, Patrick A., 4,242,148, Cl. 136-221.000.

Thibault, Jacques G. A. Palettizing-depalettizing apparatus. 4,242,025, Cl. 414-70.000.

Thieme, Roland: *See—*
Heyneman, Guido; Vandenbossche, Christiaan; and Thieme, Roland, 4,242,301, Cl. 422-68.000.

Thies, Peter W.; Asai, Akiji; and David, Samuell, to Kali-Chemie Pharma GmbH. 2,9-Dioxatricyclo [4,3,1,03,7] decane derivatives and pharmaceutical compositions. 4,242,341, Cl. 424-248.550.

Thomas & Betts Corporation: *See—*
Gomez, Jose J., 4,241,966, Cl. 339-45.00M.

Thomas, Jacques A.: *See—*
Abdalla, Mohamed I.; and Thomas, Jacques A., 4,242,370, Cl. 427-66.000.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Contact lens disinfector unit. 4,242,572, Cl. 219-521.000.

Thomas, Richard E. Electrically powered self-heating inoculating loop. 4,242,462, Cl. 435-292.000.

Thomson-CSF: *See—*
Galves, Jean-Pierre, 4,242,371, Cl. 427-68.000.
Gauzan, Pierre, 4,242,755, Cl. 375-114.000.
Gloanec, Maurice, 4,242,597, Cl. 307-221.00B.

Thomson, Kenneth W., to Eastman Kodak Company. Folding camera. 4,241,986, Cl. 354-193.000.

Thurston, Marlin O.: *See—*
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,241,519, Cl. 434-43.000.

Thyssen Edelstahlwerke AG: *See—*
Brandis, Helmut; Weigand, Hans H.; and Spyra, Wolfgang, 4,242,130, Cl. 75-126.00C.

TI Raleigh Industries Limited: *See—*
Hutcheon, Keith F.; and Cordingley, Laurence A., 4,242,385, Cl. 428-31.000.

Tibolla, Julius F., to GTE Sylvania Wiring Devices, Inc. Mounting means for interchangeable switch handles. 4,242,552, Cl. 200-339.000.

Tien, Ping K.: *See—*
Dayem, Aly H.; Geballe, Theodore H.; Patel, Chandra K. N.; and Tien, Ping K., 4,242,419, Cl. 428-661.000.

Tihanyi, Jenoe: *See—*
Meusburger, Guenther; Knauer, Karl; and Tihanyi, Jenoe, 4,242,603, Cl. 307-238.000.

Tillman, James J.: *See—*
Gagnon, Donald W.; and Tillman, James J., 4,242,250, Cl. 260-33.4SB.

Tillmann, Ditmar K.: *See—*
Wilson, Harold R.; and Tillmann, Ditmar K., 4,241,965, Cl. 339-4.000.

Timex Corporation: *See—*
Leibowitz, Marshall, 4,241,984, Cl. 350-337.000.

Tissot, Pierre L. Integrated circuit light emitting electronic malfunction checking system. 4,242,633, Cl. 324-73.00R.

Titov, Mikhail Y.: *See—*
Rogov, Viktor F.; Lipatov, Nikolai K.; Tatevosian, Ruben A.; Titov, Mikhail Y.; Tereschenko, Lev A.; and Yakovlev, Arian M., 4,242,141, Cl. 106-89.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,242,230, Cl. 252-429.00B.
Ueno, Hiroshi; Imai, Masafumi; Inaba, Naoti; Yoda, Makoto; and Wada, Shozo, 4,242,231, Cl. 252-429.00B.

Toeppen, Thurston H. Tamper indicating construction for plastic closures. 4,241,842, Cl. 215-252.000.

Tokyo Broadcasting System Inc.: *See—*
Ito, Yutaka; Yajima, Kazuo; Iwanaga, Yoshiteru; Takahashi, Hiroshi; and Inaba, Masao, 4,242,704, Cl. 358-167.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Huzii, Norihito, 4,241,696, Cl. 118-691.000.
Suzuki, Nobuo, 4,242,599, Cl. 307-311.000.
Takahashi, Takashi; Katsura, Masaki; Kaneda, Tadao; Hiraki, Hideaki; and Shiratori, Masayuki, 4,242,303, Cl. 422-98.000.

Tolbert, Love J. Pull-on action slacks. 4,241,460, Cl. 2-234.000.

Tomita, Seisuke: *See—*
Hoshino, Takashi; Imaizumi, Setsuko; and Tomita, Seisuke, 4,242,472, Cl. 525-343.000.

Tomotaka, Tatsumi: *See—*
Chikanobu, Kimijima; Asao, Kosakai; Tutomu, Shioya; and Tomotaka, Tatsumi, 4,241,512, Cl. 33-438.000.

Tomy Kogyo Co., Inc.: *See—*
Watanabe, Hiroyuki, 4,241,925, Cl. 273-316.000.

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Buchreiter, Georg; Kniep, Peter; Scheinost, Kurt; and Vollbrecht, Heinz-Rudiger, 4,242,319, Cl. 423-383.000.

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von Philipsborn, Gerda: *See*—
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Varsanyi, Denis; and Handschin, Gert, 4,242,333, Cl. 424-225.000.

Vyzkumny a vyvojovy ustav Zavodu vaseobecneho strojirenstvi: *See*—
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W. C. Dillon & Co., Inc.: *See*—
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W. R. Grace & Co.: *See*—
Dacey, Raymond B.; and Stringer, Frederick D., 4,242,297, Cl. 264-230.000.
Hill, Richard N., 4,242,198, Cl. 423-321.00R.
Wood, Louis L., 4,241,537, Cl. 47-77.000.

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Wiedenfeld, Helmut; and Reinardy, Peter, 4,241,480, Cl. 28-213.000.

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August, Peter; and Primas, Willi, 4,242,486, Cl. 528-14.000.

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Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,242,230, Cl. 252-429.00B.
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Wade, Peter C.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Indolylalkyl esters of mercaptoalkanoic acids. 4,242,265, Cl. 260-326.12R.

Wagner, Kuno: *See*—
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Wagner, Roland: *See*—
Pailer, Mathias; and Wagner, Roland, 4,242,360, Cl. 424-343.000.

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Nagashima, Sachio; and Wake, Makoto, 4,241,904, Cl. 266-209.000.

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Matucheski, Joseph V.; Yee, Clifford S. L.; Spellman, Michael T.; Hartley, Donald J.; and Barton, William D., 4,242,046, Cl. 416-132.00A.

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Warble, Charles E., to Commonwealth Scientific and Industrial Research Organization. Specimen holder for electron microscopy and electron diffraction. 4,242,586, Cl. 250-443.000.

Ward, George G. Wraparound device. 4,242,387, Cl. 428-35.000.

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Washburn, Clyde, Jr., to Harris Corporation. Method and apparatus for modulating a phase locked loop. 4,242,649, Cl. 332-18.000.

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Watanabe, Hiroyuki, to Tomy Kogyo Co., Inc. Toy having projectile movable in both coordinates of a plane. 4,241,925, Cl. 273-316.000.

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Watanabe, Toshiyuki: *See*—
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Watts, James P. Method for forming a hole in the earth. 4,242,013, Cl. 405-272.000.

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Weatherchem Corporation: *See*—
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Weaver, Lelland A.: *See*—
Liu, Chi-sheng; Feldman, Donald W.; Williams, Roy K.; and Weaver, Lelland A., 4,242,648, Cl. 331-94.50D.

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Weberndoerfer, Volkmar: *See*—
Schlecht, Helmut; Weberndoerfer, Volkmar; and Widder, Rudi, 4,242,187, Cl. 204-162.0SH.

Webster, E. Graham, to Sperry Corporation. Combine unloading auger safety switch. 4,241,566, Cl. 56-14.600.

Weeks, Thomas J., Jr.: *See*—
Weber, Willis W.; Hill, Richard F.; and Weeks, Thomas J., Jr., 4,242,271, Cl. 260-448.0AD.

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Weick, Heinz Hermann: *See*—
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Weigand, Hans H.: *See*—
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Weil, Edward D., to Stauffer Chemical Company. Halogenated triphosphates. 4,242,288, Cl. 260-929.000.

Weimer, Paul K., to RCA Corporation. Line transfer CCD imagers. 4,242,700, Cl. 358-44.000.

Weinlich, Tilman L., to Konrad, Christel. Multiple glazing units. 4,242,386, Cl. 428-34.000.

Weiser, Sidney, to Exotech, Incorporated. Apparatus for measuring the quality of optical equipment. 4,241,996, Cl. 356-124.500.

Welch, Herbert E.: *See*—
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Welch, M. Bruce, to Phillips Petroleum Company. Catalyst and process of polymerization of alpha monoolefins. 4,242,480, Cl. 526-125.000.
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Cable, Harold E., 4,241,664, Cl. 104-118.000.
Weldy, Floyd P.: *See*—
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Wells Manufacturing Company: *See*—
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Wenger, Jerry A.; Clausen, Herman A.; Boeddeker, David R.; and Urch, Harvey M., 4,241,777, Cl. 160-135.000.
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Wernet, William F.; Adams, William J.; and Haskins, Steve W., to Northern Telecom, Inc. Multiple cantilever spring contact hook switch. 4,242,543, Cl. 200-1.00A.
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Westermann, Lothar; and Wasel-Nielen, Horst-Dieter, to Hoechst Aktiengesellschaft. Composition suitable for use in cleaning panes of glass. 4,242,217, Cl. 252-135.000.
Western Electric Company, Inc.: *See*—
Hardesty, Edwin C., 4,241,974, Cl. 339-154.00A.
Saban, John F., 4,242,717, Cl. 361-308.000.
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Glatthorn, Raymond H., 4,242,563, Cl. 219-125.110.
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Maier, Alfred E.; and Ricci, Louis N., 4,242,577, Cl. 200-153.00G.
Moore, Robert A., 4,242,653, Cl. 333-141.000.
Shariff, Sadiq A.; Wilson, John R.; Bharteey, Brij M.; and Rowe, Neal E., 4,242,718, Cl. 361-341.000.
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Silvestri, George J., Jr., 4,242,041, Cl. 415-115.000.
Yannone, Robert A.; and Shields, James J., 4,242,592, Cl. 290-40.00R.
Westlake, Edward B., Jr. One-piece plastic safety razor. 4,241,501, Cl. 30-59.000.
Westphalen, Wilhelm. Floating passenger automotive vehicle as touring and water-sports mobile. 4,241,686, Cl. 440-59.000.
Westvaco Corporation: *See*—
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Whiteman, Paul L.; and Orr, Vernon E., to Morgan Trailer Manufacturing Co., Inc. Ramp and ramp carrier for trucks and the like. 4,242,032, Cl. 414-537.300.
Whittaker Corporation: *See*—
Mansukhani, Ishwar R., 4,242,369, Cl. 427-47.000.
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Widder, Rudi: *See*—
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Wiedenfeld, Helmut; and Reinardy, Peter, to W. Schlafhorst & Co. Comb section pair of an expansion comb. 4,241,480, Cl. 28-213.000.
Wiese, Winfred J., to Borg-Warner Corporation. Mechanical seal. 4,241,927, Cl. 277-87.000.
Wiesner, Dale E. Vibrating conveyor for use with packaging apparatus. 4,241,769, Cl. 141-83.000.
Wilger, John F.; Nakano, Gregory S.; Uyetake, Tadao; Orillo, Stephen, Jr.; and Higa, Teikichi, to United States of America, Navy. Vertical drive mechanism for a cutting apparatus. 4,241,623, Cl. 74-765.000.
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Williamson, Roger J., to ITT Industries, Inc. Flowmeter. 4,241,612, Cl. 73-861.220.
Willis, Wilburn C., to Aluminum Company of America. Safety closure assembly with a sheet metal overcap. 4,241,840, Cl. 215-220.000.
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Wilson, John R.; and Worbey, Terence I., to Imperial Chemical Industries Limited. Films of thermoplastics materials having roughened surfaces. 4,242,396, Cl. 428-141.000.
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Wood, Clifford. Amusement device. 4,241,977, Cl. 350-4.100.
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Wu, Samuel C.; Holick, Stephen A.; and Bottelsen, Robert A., to Coors Container Company. Container return apparatus. 4,241,821, Cl. 194-4.00C.
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Yamada, Hideaki; Takahashi, Satomi; and Yoneda, Koji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing N-carbamoyl-D-thienylglycines. 4,242,452, Cl. 435-117.000.
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Yamano, Hiroyoshi, to Kabushiki Kaisha Morita Seisakusho. Dental panoramic radiographic apparatus capable of concurrently taking normal picture of temporomandibular joint. 4,242,585, Cl. 250-439.00P.
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Yannone, Robert A.; and Shields, James J., to Westinghouse Electric Corp. Gas turbine power plant control apparatus including an ambient temperature responsive control system. 4,242,592, Cl. 290-40.00R.
Yarimie, Chris M.; and Moore, Jerry E., to New World Manufacturing, Inc. Waveless waterbed mattress. 4,241,465, Cl. 5-452.000.
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Yellin, Tobias O.; and Mant, Derrick M., to Imperial Chemical Industries Limited; and ICI Americas Inc. Antisecretory thiadiazole derivatives, processes for their manufacture and pharmaceutical compositions containing them. 4,242,350, Cl. 424-270.000.
Yellin, Tobias O.; and Mant, Derrick M., to Imperial Chemical Industries Limited; and ICI Americas Inc. Antisecretory oxadiazoles and pharmaceutical compositions containing them. 4,242,351, Cl. 424-272.000.
Yntema, Klaas; and Klos, Cornelis D. W., to Akzona Incorporated. Fire retardant curable ethylenically unsaturated compositions. 4,242,255, Cl. 260-45.75P.
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Ueno, Hiroshi; Imai, Masafumi; Inaba, Naomi; Yoda, Makoto; and Wada, Shozo, 4,242,230, Cl. 252-429.00B.
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Yokota, Yoshihisa; Hosokawa, Teruo; and Sakashita, Kiichiro, to Showa Yuka Kabushiki Kaisha. Process for producing an improved ethylenic polymer. 4,242,479, Cl. 526-124.000.
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Yoshida, Susumu; Ishigaki, Yoshio; and Nagai, Tamiji, to Sony Corporation. Current control circuit. 4,242,714, Cl. 361-152.000.
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Young, Jerry W., to Phillips Petroleum Company. Container processing apparatus. 4,241,848, Cl. 221-222.000.
Young, Morris S., to Airco, Inc. Aluminum-stabilized multifilamentary superconductor. 4,242,536, Cl. 174-128.00S.
Young, Ronald J.: *See*—
Cooper, George W.; and Young, Ronald J., 4,242,359, Cl. 424-325.000.
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Yuasa, Teruo: *See*—
Kato, Nobukatu; Takase, Tsutomu; Morimoto, Yoshio; Yuasa, Teruo; and Hattori, Minoru, 4,242,528, Cl. 568-781.000.
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Takaya, Masahiro; Yamada, Toshihiro; and Yuizono, Tomokazu, 4,242,512, Cl. 544-239.000.
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Zakora, Miloslav, to A/S N. Foss Electric. Dosage pump. 4,242,058, Cl. 414-437.000.
Zelacolor Systems Establishment: *See*—
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Ziegler, B. Randall: *See*—
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Ziff-Davis Publishing Company: *See*—
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Bruning, Hugo A. C. M.; van Vucht, Johannes H. N.; Westendorp, Frans F.; and Zijlstra, Hinne, 4,242,315, Cl. 423-252.000.
Zimmerman, Robert L., to Texaco Development Corporation. Urea derivatives and use as polyurethane catalysts. 4,242,467, Cl. 521-129.000.
Zitser, Vitaly A.; Melnikov, Alexandr V.; Bachelis, Leonid V.; Morozov, Jury E.; Ivanov, Vladimir A.; and Abramova, Zinaida A. Apparatus for manufacturing foundry cores. 4,241,779, Cl. 164-207.000.
Zuckerman, Joseph L.; and Bzik, John W., to J. P. Stevens & Co., Inc. Thermoplastic compositions and automotive carpeting backed therewith. 4,242,395, Cl. 428-96.000.
Zumbrunnen, Allen D. Silicon refining process. 4,242,175, Cl. 156-616.00R.
Zwagemakers, Johannes M. A.: *See*—
van Dijk, Jan; and Zwagemakers, Johannes M. A., 4,242,348, Cl. 424-267.000.
Zwayer, Don L.; and Sadler, Martin D., to Natural Energy of Oklahoma, Inc. Rapid thrust exercise machine. 4,241,913, Cl. 272-130.000.
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,242,264, Cl. 260-326.00C.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF DECEMBER, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Angstadt, Howard P.; Tinkler, Jack D.; Norton, Richard V.; and Bushick, Ronald D., to Sun Ventures, Inc. Ammoxidation process. Re. 30,464, Cl. 260-465.00C.

Bogar, Jean Armstrong, executrix: *See*—
Bogar, William H., deceased; and Irwin, Howard D., Re. 30,461, Cl. 308-137.000.

Bogar, William H., deceased (by Bogar, Jean Armstrong, executrix); and Irwin, Howard D., to Du Pont de Nemours, E. I., and Company. Resilient center bearing assembly. Re. 30,461, Cl. 308-137.000.

Brunswick Corporation: *See*—
House, Robert W.; King, Rolland D.; Roller, Robert F.; and Williams, David A., Re. 30,467, Cl. 364-411.000.

Bushick, Ronald D.: *See*—
Angstadt, Howard P.; Tinkler, Jack D.; Norton, Richard V.; and Bushick, Ronald D., Re. 30,464, Cl. 260-465.00C.

Dolby Laboratories, Inc.: *See*—
Dolby, Ray M.; and Spencer, Paul A., Re. 30,468, Cl. 455-72.000.

Dolby, Ray M.; and Spencer, Paul A., to Dolby Laboratories, Inc. Signal compressors and expanders. Re. 30,468, Cl. 455-72.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bogar, William H., deceased; and Irwin, Howard D., Re. 30,461, Cl. 308-137.000.

House, Robert W.; King, Rolland D.; Roller, Robert F.; and Williams, David A., to Brunswick Corporation. Bowling scorer utilizing semiconductor elements. Re. 30,467, Cl. 364-411.000.

Ikegami, Hidetsugu. Method and device for generating a magnetic field of a potential with electric current components distributed according to a derivative of the potential. Re. 30,466, Cl. 335-213.000.

Irwin, Howard D.: *See*—
Bogar, William H., deceased; and Irwin, Howard D., Re. 30,461, Cl. 308-137.000.

King, Rolland D.: *See*—
House, Robert W.; King, Rolland D.; Roller, Robert F.; and Williams, David A., Re. 30,467, Cl. 364-411.000.

Miller, David R.; and Wolfe, Jack E., deceased (by Wolfe, Edith B., executrix), to Prismo Universal Corporation. Traffic paint method and composition. Re. 30,463, Cl. 260-22.0CQ.

Norton, Richard V.: *See*—
Angstadt, Howard P.; Tinkler, Jack D.; Norton, Richard V.; and Bushick, Ronald D., Re. 30,464, Cl. 260-465.00C.

Pohl, Leo. Lift assembly for van or the like. Re. 30,462, Cl. 414-545.000.

Prismo Universal Corporation: *See*—
Miller, David R.; and Wolfe, Jack E., deceased, Re. 30,463, Cl. 260-22.0CQ.

Roller, Robert F.: *See*—
House, Robert W.; King, Rolland D.; Roller, Robert F.; and Williams, David A., Re. 30,467, Cl. 364-411.000.

Schoerner, Roger J., to Southwire Company. Aluminum alloy wire. Re. 30,465, Cl. 428-606.000.

Southwire Company: *See*—
Schoerner, Roger J., Re. 30,465, Cl. 428-606.000.

Spencer, Paul A.: *See*—
Dolby, Ray M.; and Spencer, Paul A., Re. 30,468, Cl. 455-72.000.

Sun Ventures, Inc.: *See*—
Angstadt, Howard P.; Tinkler, Jack D.; Norton, Richard V.; and Bushick, Ronald D., Re. 30,464, Cl. 260-465.00C.

Tinkler, Jack D.: *See*—
Angstadt, Howard P.; Tinkler, Jack D.; Norton, Richard V.; and Bushick, Ronald D., Re. 30,464, Cl. 260-465.00C.

Williams, David A.: *See*—
House, Robert W.; King, Rolland D.; Roller, Robert F.; and Williams, David A., Re. 30,467, Cl. 364-411.000.

Wolfe, Edith B., executrix: *See*—
Miller, David R.; and Wolfe, Jack E., deceased, Re. 30,463, Cl. 260-22.0CQ.

Wolfe, Jack E., deceased: *See*—
Miller, David R.; and Wolfe, Jack E., deceased, Re. 30,463, Cl. 260-22.0CQ.

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Basler, Donald S.; Myer, Shirley P.; and Tienprasid, Wallop, 257,710, Cl. D6-179.000.

Abraham, Adolph. Ring toss game target. 257,745, 12-30-80, Cl. D21-4.000.

Abrain, Edmond S.: *See*—
Lyon, Herbert W.; Abrain, Edmond S.; Jepson, John W.; Rambo, Charles D.; and Santy, Arthur F., 257,736, Cl. D21-220.000.

Acushnet Company: *See*—
Lyon, Herbert W.; Abrain, Edmond S.; Jepson, John W.; Rambo, Charles D.; and Santy, Arthur F., 257,736, Cl. D21-220.000.

AFA Corporation, The: *See*—
Humphrey, Theodore J., II; and Wesner, Walter H., 257,740, Cl. D23-35.000.

Angrisano, Donald A.; and Mecca, Anthony F. Child's play garment. 257,697, 12-30-80, Cl. D2-209.000.

Arco Industries Ltd.: *See*—
Rosenberg, Herbert, 257,734, Cl. D21-129.000.

Baldwin Piano and Organ Company: *See*—
Kimble, Thomas E., 257,727, Cl. D17-14.000.

Basler, Donald S.; Myer, Shirley P.; and Tienprasid, Wallop, to Abbott Laboratories. Combined work table and shelf unit primarily for use by a pediatrician. 257,710, 12-30-80, Cl. D6-179.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy cement mixer truck body. 257,735, 12-30-80, Cl. D21-138.000.

Brough, Wayne S. Combined desk set, display chamber and nameplate. 257,729, 12-30-80, Cl. D19-77.000.

Brunty, Fred; and Hall, William J. Projector for elongated projectiles. 257,737, 12-30-80, Cl. D22-3.000.

Buddy L Corporation: *See*—
Herstein, Barry S.; and Salmon, Robert, 257,728, Cl. D18-1.000.

Cassina, Franco, to Cassina S.p.A. Arm-chair. 257,708, 12-30-80, Cl. D6-71.000.

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Cassina, Franco, 257,708, Cl. D6-71.000.

Champion International Corporation: *See*—
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Colorcraft Corporation: *See*—
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De Vries, Jochem J.: *See*—
van Hemmen, Dirk J.; and De Vries, Jochem J., 257,744, Cl. D28-47.000.

Dutcher, Daniel P., to Champion International Corporation. Metered package blank. 257,718, 12-30-80, Cl. D9-432.000.

Eshelman, Cheston L. Prop for flat files. 257,730, 12-30-80, Cl. D19-86.000.

Fairchild Industries, Inc.: *See*—
Marrujo, Ralph G., 257,707, Cl. D6-48.000.

Famolare, Inc.: *See*—
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Famolare, Joseph P., Jr., 257,700, Cl. D2-319.000.
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Famolare, Joseph P., Jr., to Famolare, Inc. Shoe sole. 257,699, 12-30-80, Cl. D2-319.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe sole. 257,700, 12-30-80, Cl. D2-319.000.

Famolare, Joseph P., Jr., to Famolare, Inc. Shoe sole. 257,701, 12-30-80, Cl. D2-322.000.

Framer, Sam, to Colorcraft Corporation. Telephone kiosk. 257,705, 12-30-80, Cl. D6-25.000.

Gabr, Saad Z. M. Stand for light fixture or similar article. 257,704, 12-30-80, Cl. D26-106.000.

General Foods Corporation: *See*—
Pettengill, Floyd E., 257,715, Cl. D9-387.000.

Gerlach, Willfried. Decorator module. 257,742, 12-30-80, Cl. D25-80.000.

Globol-Werk GmbH: *See*—
Manthei, Rainer, 257,738, Cl. D23-3.000.

Haber, Terry M. Packaging for billiard balls. 257,717, 12-30-80, Cl. D9-431.000.

Hall, William J.: *See*—
Brunty, Fred; and Hall, William J., 257,737, Cl. D22-3.000.

Herstein, Barry S.; and Salmon, Robert, to Buddy L Corporation. Typewriter. 257,728, 12-30-80, Cl. D18-1.000.

Heuser, Karl H., to Huwil-Werke GmbH. Combined handle and push-button housing for electrically encoded push-button lock. 257,714, 12-30-80, Cl. D8-331.000.

Humphrey, Theodore J., II; and Wesner, Walter H., to AFA Corporation, The. Sprayer nozzle. 257,740, 12-30-80, Cl. D23-35.000.
Huwil-Werke GmbH: *See—*
Heuser, Karl H., 257,714, Cl. D8-331.000.
Ingram, Gary L., to Spencer Wright Industries, Inc. Gated hook for tufting machines. 257,725, 12-30-80, Cl. D15-78.000.
Irion, Junghans, to Siemens Corporation. Face plate for a fluid flow meter. 257,719, 12-30-80, Cl. D10-96.000.
Jepson, John W.: *See—*
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Kimble, Thomas E., to Baldwin Piano and Organ Company. Electric guitar. 257,727, 12-30-80, Cl. D17-14.000.
Klawitter, Ronald R., to Steven Manufacturing Company. Toy coffee maker. 257,732, 12-30-80, Cl. D21-122.000.
Klawitter, Ronald R., to Steven Manufacturing Company. Toy mixer. 257,733, 12-30-80, Cl. D21-122.000.
Korach, Irving S. Casserole for a microwave oven. 257,713, 12-30-80, Cl. D7-17.000.
Levine, Joe Ann; Saper, Roberta L.; and Lewis, Beverly R. Kitchen appliance cover. 257,712, 12-30-80, Cl. D6-269.000.
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Lewis, Lawrence A. Display rack. 257,709, 12-30-80, Cl. D6-114.000.
Liebman, Arno J. Combined table and multiple hook support. 257,706, 12-30-80, Cl. D6-27.000.
Luker, Graham J., to Macnaught Pty. Limited. Grease pump. 257,739, 12-30-80, Cl. D15-7.000.
Lyon, Herbert W.; Abrain, Edmond S.; Jepson, John W.; Rambo, Charles D.; and Santy, Arthur F., to Acushnet Company. Golf club head. 257,736, 12-30-80, Cl. D21-220.000.
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Marrujo, Ralph G., to Fairchild Industries, Inc. Aircraft seat. 257,707, 12-30-80, Cl. D6-48.000.
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Maza, Dale T.; and Tomblin, Glen E., to Rubbermaid Commercial Products Inc. Dolly plate for a refuse container. 257,721, 12-30-80, Cl. D12-31.000.
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Rockman, Harold D. Barricade. 257,720, 12-30-80, Cl. D10-109.000.
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CLASSIFICATION OF PATENTS

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373 4,241,560
390 4,241,561
438 4,241,562
511 4,241,563
575 4,241,564

CLASS 55

18 4,242,107
40 4,242,108
230 4,242,109
269 4,242,110
4,242,111
4,242,112
302 4,242,113
304 4,242,114
347 4,242,115

CLASS 56

10.7 4,241,565
14.6 4,241,566
17.4 4,241,567
294 4,241,568
330 4,241,569

CLASS 57

1 UN 4,241,570
58.89 4,241,571
4,241,572
127.7 4,241,573
200 4,241,574

CLASS 59

93 4,241,575

CLASS 60

39.34 4,241,576
420 4,241,577
478 4,241,578
504 4,241,579
522 4,241,580
538 4,241,581
550 4,241,582
555 4,241,583
580 4,241,584
646 4,241,585
738 4,241,586

CLASS 62

80 4,241,587
199 4,242,116
238 E 4,241,588
265 4,241,589
343 4,241,590
402 4,241,591
514 R 4,241,592

CLASS 64

14 4,241,593

CLASS 65

3 A 4,242,117
4,242,118

CLASS 70

38 A 4,241,594
347 4,241,595

CLASS 71

67 4,242,119
89 4,242,120
93 4,242,121
100 4,242,122
111 4,242,123

CLASS 72

91 4,241,596
327 4,241,597
354 4,241,598
356 4,241,599
411 4,241,600

CLASS 73

17 R 4,241,601
56 4,241,602
129 4,241,603
144 4,241,616
189 4,241,604
290 R 4,241,606
490 4,241,607
606 4,241,608
623 4,241,609
626 4,241,610
4,241,611
861.22 4,241,612
861.71 4,241,613
861.94 4,241,605

CLASS 74

15.63 4,241,614
61 4,241,615
440 4,241,619
573 R 4,241,620
700 4,241,621
740 4,241,622
765 4,241,623
863 4,241,618

CLASS 75

6 4,242,124
37 4,242,125
51 4,242,126
84.5 4,242,136
99 4,242,127
109 4,242,128
4,242,129
126 C 4,242,130
157.5 4,242,131
4,242,132
4,242,133
173 A 4,242,135
173 C 4,242,134

CLASS 76

83 4,241,624
107 A 4,241,625

CLASS 81

3.46 R 4,241,626
4,241,627
9.51 4,241,628

CLASS 83

343 4,241,629
409 4,241,630
411 R 4,241,631
560 4,241,632
676 4,241,633
763 4,241,634
800 4,241,635

CLASS 84

1.01 4,241,636
1.16 4,241,637

CLASS 85

46 4,241,638
47 4,241,639

CLASS 91

186 4,241,640
189 A 4,241,641
391 R 4,241,642
446 4,241,643
447 4,241,644

CLASS 98

37 4,241,645
115 SB 4,241,646
121 A 4,241,647

CLASS 99

349 4,241,648
354 4,241,649
372 4,241,650

CLASS 100

35 4,241,651
49 4,241,652
100 4,241,653
189 4,241,654

CLASS 101

79 4,241,655
148 4,241,656
211 4,241,657
217 4,241,658
231 4,241,659

CLASS 102

56 R 4,241,660
103 4,241,661
210 4,241,662

CLASS 104

16 4,241,663
118 4,241,664

CLASS 105

4 R 4,241,665
59 4,241,666
199 C 4,241,667

CLASS 106

14.5 4,242,137
18.18 4,242,138
22 4,242,139
72 4,242,140
73.3 4,242,213
89 4,242,141
97 4,242,142
272 4,242,143
281 R 4,242,144

CLASS 108

26 4,241,668
152 4,241,669

CLASS 110

104 R 4,241,670
188 4,241,671
346 4,241,672
347 4,241,673

CLASS 111

52 4,241,674

CLASS 112

79 A 4,241,675
4,241,676
167 4,241,677
225 4,241,678
255 4,241,679
275 4,241,680
322 4,241,681

CLASS 114

67 R 4,241,682
74 R 4,241,683
144 R 4,241,684
264 4,241,685

CLASS 118

50 4,241,689
63 4,241,690
126 4,241,691
303 4,241,692
504 4,241,693
647 4,241,694
658 4,241,695
691 4,241,696
713 4,241,697
730 4,241,698

CLASS 119

14.03 4,241,699
52 AF 4,241,700

CLASS 122

460 4,241,701

CLASS 123

41.7 4,241,702
48 R 4,241,703
78 B 4,241,705
90.3 4,241,706
90.55 4,241,707
202 4,241,713
407 4,241,709
418 4,241,708
432 4,241,704
4,241,712
440 4,241,710
499 4,241,714
559 4,241,711

CLASS 124

24 R 4,241,715
27 4,241,716
83 4,241,717

CLASS 126

21 R 4,241,718
66 4,241,719
110 C 4,241,720
204 4,241,721
263 4,241,722
350 R 4,241,723
415 4,241,724
428 4,241,725
438 4,241,726
446 4,241,727

CLASS 127

46 R 4,242,145

CLASS 128

1.1 4,241,728
4 4,241,729
80 C 4,241,730
94 4,241,731
204.24 4,241,732
275 4,241,733
325 4,241,734
344 4,241,735
419 PG 4,241,736
425 4,241,737
666 4,241,738
725 4,241,739
728 4,241,740

CLASS 131

173 4,241,741
235 R 4,241,742

CLASS 132

88.7 4,241,743

CLASS 134

7 4,242,146
168 R 4,241,744

CLASS 135

1 R 4,241,745
4 R 4,241,746

CLASS 136

221 4,242,148
253 4,242,147

CLASS 137

68 R 4,241,747
77 4,241,748
100 4,241,749
101.19 4,241,750
103 4,241,751
107 4,241,752
116.3 4,241,753
119 4,241,754
496 4,241,756
501 4,241,757
512.15 4,241,758
636.4 4,241,759
829 4,241,760
883 4,241,761
899 4,241,755

CLASS 138

105 4,241,762
127 4,241,763

CLASS 139

1 R 4,241,764
142 4,241,765
435 4,241,766
443 4,241,767

CLASS 141

8 4,241,768
83 4,241,769
198 4,241,770

CLASS 144

145 A 4,241,771

CLASS 145

63 4,241,773

CLASS 148

1.5 4,242,149
6.3 4,242,150
6.35 4,242,151
9.5 4,242,152
12 B 4,242,153
16.7 4,242,154
113 4,242,155
175 4,242,156

CLASS 150

1.5 R 4,241,774

CLASS 152

330 RF 4,241,775
381.4 4,241,776

CLASS 156

64 4,242,157
92 4,242,158
155 4,242,159
175 4,242,160
197 4,242,161
212 4,242,162
242 4,242,163
304.1 4,242,164
313 4,242,165
351 4,242,166
357 4,242,167
4,242,168
394 4,242,169
438 4,242,170
485 4,242,171

499 4,242,172
523 4,242,173
563 4,242,174
616 R 4,242,175
630 4,242,176

CLASS 160

135 4,241,777

CLASS 162

17 4,242,177

CLASS 164

131 4,241,778
207 4,241,779
333 4,241,780

CLASS 165

1 4,241,781
10 4,241,782
48 R 4,241,783
105 4,241,784
172 4,241,785

CLASS 166

77 4,241,786
105 4,241,787
105.5 4,241,788
241 4,241,789
260 4,241,790
292 4,241,791

CLASS 171

63 4,241,792

CLASS 172

551 4,241,793
804 4,241,794

CLASS 173

90 4,241,795

CLASS 174

15 S 4,242,534
38 4,242,533
42 4,242,537
88 R 4,242,535
128 S 4,242,536

CLASS 175

24 4,241,796
237 4,241,797
329 4,241,798
361 4,241,799
400 4,241,800

CLASS 176

30 4,242,178

CLASS 177

211 4,241,801

CLASS 178

3 4,241,802

CLASS 179

2 EB 4,242,538
5.5 4,242,539
6 R 4,242,540
110 A 4,242,541
170 R 4,242,542

CLASS 180

8 R 4,241,803
79.1 4,241,804

CLASS 181

232 4,241,805
284 4,241,806

CLASS 182

121 4,241,807
155 4,241,808
199 4,241,809

CLASS 188

1 C 4,241,810
43 4,241,811
73.1 4,241,812
77 R 4,241,813
266 4,241,814
282 4,241,815
298 4,241,816

CLASS 192

12 C 4,241,817
55 4,241,818
70.27 4,241,819
89 B 4,241,820

CLASS 194

4 C 4,241,821

CLASS 198

406 4,241,822
727 4,241,823
745 4,241,824
782 4,241,825
825 4,241,826

CLASS 200

1 A 4,242,543
5 E 4,242,544
5 R 4,242,545
16 A 4,242,546
38 R 4,242,547
47 4,242,548
144 R 4,242,549
148 R 4,242,550
153 G 4,242,577
302 4,242,551
339 4,242,552

CLASS 204

2.1 4,242,179
43 N 4,242,180
52 R 4,242,181
54 R 4,242,182
73 R 4,242,183
98 4,242,184
4,242,185
157.1 H 4,242,186
162 SH 4,242,187
164 4,242,188
195 M 4,242,191
195 R 4,242,189
212 4,242,190
213 4,242,192
296 4,242,193
299 R 4,242,194

CLASS 206

248 4,241,827
306 4,241,828
328 4,241,829
422 4,241,630
506 4,241,831
523 4,241,832
570 4,241,833
611 4,241,834

CLASS 208

11 LE 4,242,195
40 4,242,196

CLASS 209

3 4,242,197
582 4,241,835

CLASS 210

222 4,242,200
240 4,242,201
242.3 4,242,202
321.1 4,242,203
326 4,242,204
400 4,242,205
489 4,242,206
500.1 4,242,207
500.2 4,242,208
519 4,242,209
758 4,242,199

CLASS 211

14 4,241,836

CLASS 212

177 4,241,837
255 4,241,838

CLASS 215

100 R 4,241,839
220 4,241,840
252 4,241,841
4,241,842

CLASS 219

10.49 R 4,242,553
10.55 B 4,242,554
69 E 4,242,557
69 G 4,242,560
69 M 4,242,555
69 W 4,242,556
4,242,558
4,242,559
109 4,242,561
121 P 4,242,562
125.11 4,242,563
208 4,242,564
216 4,242,565
4,242,566
225 4,242,567
296 4,242,568
314 4,242,569
441 4,242,570
513 4,242,571
521 4,242,572
528 4,242,573

CLASS 220

5 A 4,241,843
67 4,241,844
203 4,241,845
318 4,241,846

CLASS 221

12 4,241,847
222 4,241,848
266 4,241,849

CLASS 222

39 4,241,850
83.5 4,241,851
103 4,241,852
207 4,241,853
4,241,854
479 4,241,855
539 4,241,856

CLASS 224

32 A 4,241,857
42.03 A 4,241,858
312 4,241,859
316 4,241,860

CLASS 227

135 4,241,861
155 4,241,862

CLASS 229

27 4,241,863
43 4,241,864
62 4,241,865

CLASS 233

24 4,241,866

CLASS 235

85 R 4,241,867
92 DN 4,242,574
92 FL 4,242,575
435 4,242,576

CLASS 236

12 A 4,241,868
15 BR 4,241,869
49 4,241,871
87 4,241,872
4,241,873

CLASS 237

55 4,241,874

CLASS 238

10 F 4,241,875

CLASS 239

251 4,241,464
265.27 4,241,876
405 4,241,877
591 4,241,878
677 4,241,879
691 4,241,880

CLASS 241

28 4,241,881
236 4,241,882

CLASS 242

46.4 4,241,883
54 R 4,241,884
55.2 4,241,885
107.2 4,241,886
107.7 4,241,887

CLASS 244

3.15 4,241,889
137 R 4,241,890

CLASS 248

123.1 4,241,891
346 4,241,892
425 4,241,893
576 4,241,894

CLASS 250

201 4,242,579
203 R 4,242,580
227 4,242,581
328 4,242,582
358 R 4,242,583
423 P 4,242,584
439 P 4,242,585
443 4,242,586
491 4,242,587
492 A 4,242,588
577 4,242,589
4,242,590

CLASS 251

173 4,241,895
206 4,241,896
229 4,241,897
321 4,241,898

CLASS 252

8.8 4,242,210
25 4,242,211
51.5 R 4,242,212
75 4,242,214
100 4,242,215
103 4,242,216
135 4,242,217
143 4,242,218
174.12 4,242,219
301.1 W 4,242,220
301.17 4,242,222
301.4 H 4,242,221
313 R 4,242,223
402 4,242,224
411 R 4,242,225
422 4,242,226
428 4,242,227
429 B 4,242,229
4,242,230
4,242,231
429 C 4,242,232
429 R 4,242,228
431 N 4,242,233
439 4,242,234
455 R 4,242,235
4,242,236
455 Z 4,242,237

CLASS 254

8 B 4,241,899
4,241,900
89 H 4,241,901

CLASS 260

8 4,242,238
9 4,242,239
14 4,242,240
17.2 4,242,241
17.4 CL 4,242,242
22 CQ Re.30,463
23 AR 4,242,243
23.7 C 4,242,244
27 BB 4,242,245
28.5 AS 4,242,246
29.6 WQ 4,242,247
31.2 N 4,242,248
33.2 R 4,242,249
33.4 SB 4,242,250
4,242,252
37 N 4,242,251
40 R 4,242,254
40 TN 4,242,253
45.75 P 4,242,255
112.5 R 4,242,256
4,242,257
152 4,242,258
153 4,242,259
160 4,242,260
239 A 4,242,261
245.3 4,242,262
306 R 4,242,263
326 C 4,242,264
326.12 R 4,242,265
326.34 4,242,266
335 4,242,267
343.3 P 4,242,268
345.1 4,242,269
348.31 4,242,285
396 4,242,277
412.8 4,242,270
431 4,242,280
448 AD 4,242,271
453 RW 4,242,273
465 C Re.30,464
465 E 4,242,274
505 E 4,242,275
746 4,242,287
929 4,242,288

CLASS 261

41 D 4,242,290
93 4,242,289

CLASS 264

1 4,242,291
16 4,242,292
40.7 4,242,293
62 4,242,294
146 4,242,295
149 4,242,296
230 4,242,297
233 4,242,298
504 4,242,299
520 4,242,300

CLASS 266

44 4,241,902
109 4,241,903
209 4,241,904
236 4,241,905

CLASS 269

43 4,241,906
289 R 4,241,772

CLASS 270

54 4,241,907
55 4,241,908

CLASS 271

182 4,241,909
202 4,241,910
314 4,241,911

CLASS 272

125 4,241,912
130 4,241,913
136 4,241,914
144 4,241,915

CLASS 273

1.5 R 4,241,916
33 4,241,917
65 E 4,241,918
72 A 4,241,919
143 R 4,241,920
148 A 4,241,921
189 A 4,241,922
265 4,241,923
277 4,241,924
316 4,241,925

CLASS 274

23 R 4,241,926

CLASS 277

87 4,241,927
212 FB 4,241,928

CLASS 280

12 H 4,241,929
47.29 4,241,930
205 4,241,931
265 4,241,932
301 4,241,933
432 4,241,934
461 A 4,241,935
507 4,241,936
777 4,241,937
803 4,241,938
804 4,241,939
4,241,940
4,241,941

CLASS 283

6 4,241,942
13 4,241,943

CLASS 285

229 4,241,944

CLASS 290

1 R 4,242,591
40 R 4,242,592
53 4,242,593

CLASS 292

165 4,241,888

CLASS 293

120 4,241,945

CLASS 294

31 R 4,241,946

CLASS 296

10 4,241,947
37.7 4,241,870
216 4,241,948

CLASS 297

3 4,241,949
18 4,241,950

CLASS 299

2 4,241,951
4,241,952
4 4,241,953

CLASS 301

37 R 4,241,954

CLASS 305

35 EB 4,241,956

CLASS 307

98 4,242,594
205 4,242,595
211 4,242,596
221 B 4,242,597
221 D 4,242,600
225 R 4,242,601
232 4,242,602
238 4,242,603
251 4,242,604
270 4,242,605
310 4,242,598
311 4,242,599

CLASS 308

36.4 4,241,957
137 Re.30,461
160 4,241,958
187 4,241,959
237 R 4,241,960

CLASS 310

12 4,242,606
68 E 4,242,607
68 R 4,242,608
105 4,242,609
156 4,242,610
344 4,242,611

CLASS 312

12 4,241,955
22 4,241,961
183 4,241,962
228 4,241,963
305 4,241,964

CLASS 313

421 4,242,612
447 4,242,613

CLASS 315

153 4,242,614
169.1 4,242,615
241 P 4,242,616

CLASS 318

13 4,242,617
314 4,242,618
4,242,619
576 4,242,620
601 4,242,621
616 4,242,622
696 4,242,623
4,242,624
729 4,242,625
772 4,242,626

CLASS 320

21 4,242,627

CLASS 322

35 4,242,628

CLASS 323

17 4,242,629
60 4,242,630

CLASS 324

62 4,242,631
73 R 4,242,632
4,242,633
142 4,242,634
158 R 4,242,635

CLASS 328

63 4,242,636
110 4,242,637
144 4,242,638
155 4,242,639
187 4,242,640

CLASS 329

126 4,242,641

CLASS 330

109 4,242,642
278 4,242,643
297 4,242,644

CLASS 331

94.5 D 4,242,646
4,242,647
4,242,648
94.5 G 4,242,645

CLASS 332

18 4,242,649

CLASS 333

28 R 4,242,650
32 4,242,651
106 4,242,652
141 4,242,653
165 4,242,654
183 4,242,655
213 4,242,656

CLASS 335

207 4,242,657
213 Re.30,466
237 4,242,658

CLASS 338

28 4,242,659
195 4,242,660

CLASS 339

4 4,241,965
45 M 4,241,966
59 M 4,241,967
64 M 4,241,968
88 R 4,241,969
99 R 4,241,970
116 C 4,241,971
126 R 4,241,972
143 R 4,241,973
154 A 4,241,974
242 4,241,975
278 D 4,241,976

CLASS 340

23 4,242,661
146.3 H 4,242,662
152 T 4,242,663
168 S 4,242,664
365 R 4,242,667
539 4,242,668
567 4,242,669
568 4,242,670
572 4,242,671
573 4,242,672

630 4,242,673
635 4,242,674
711 4,242,675
4,242,676
715 4,242,677
728 4,242,678
765 4,242,679
771 4,242,680
785 4,242,681
870.28 4,242,666
870.38 4,242,665

CLASS 343

7 A 4,242,682
7.7 4,242,683
715 4,242,684
770 4,242,685
912 4,242,686

CLASS 346

75 4,242,687
4,242,688
135.1 4,242,689

CLASS 350

4.1 4,241,977
96.20 4,241,978
96.23 4,241,979
129 4,241,980
184 4,241,981
187 4,241,982
216 4,241,983
337 4,241,984

CLASS 354

99 4,241,985
193 4,241,986
195 4,241,987
293 4,241,988
299 4,241,989

CLASS 355

11 4,241,990
26 4,241,991
41 4,241,992
75 4,241,993
77 4,241,994

CLASS 356

5 4,241,995
124.5 4,241,996
309 4,241,997
319 4,241,998
331 4,241,999
374 4,242,000

CLASS 357

13 4,242,690
23 4,242,691
24 4,242,692
28 4,242,693
30 4,242,694
4,242,695
4,242,696
49 4,242,697
71 4,242,698

CLASS 358

4 4,242,699
44 4,242,700
75 4,242,701
106 4,242,702
150 4,242,703
167 4,242,704
4,242,705
213 4,242,706
280 4,242,707

CLASS 360

74.5 4,242,708
96.4 4,242,709
113 4,242,710
126 4,242,711

CLASS 361

42 4,242,712
86 4,242,713
152 4,242,714
232 4,242,715
299 4,242,716
308 4,242,717
341 4,242,718
400 4,242,719
402 4,242,720
415 4,242,721
433 4,242,722

CLASS 362

33 4,242,723
158 4,242,724
341 4,242,725
346 4,242,727
418 4,242,726

CLASS 364

411 Re.30,467
416 4,242,730
431 4,242,728
4,242,729
436 4,242,731
485 4,242,732
515 4,242,733
4,242,734
900 4,242,735

CLASS 365

184 4,242,737
189 4,242,738
191 4,242,736
203 4,242,739

CLASS 366

75 4,242,001
343 4,242,002

CLASS 367

15 4,242,740
21 4,242,741
75 4,242,742
93 4,242,743
173 4,242,744

CLASS 368

73 4,242,745
109 4,242,746
242 4,242,747
244 4,242,748

CLASS 370

85 4,242,749

CLASS 371

22 4,242,750
26 4,242,751
37 4,242,752

CLASS 375

70 4,242,753
110 4,242,754
114 4,242,755

CLASS 400

124 4,242,003
4,242,004
220.1 4,242,005
568 4,242,006

CLASS 403

13 4,242,008

CLASS 405

93 4,242,009
157 4,242,010
204 4,242,011
217 4,242,012
272 4,242,013
300 4,242,014

CLASS 406

82 4,242,015
109 4,242,007

CLASS 408

14 4,242,016
111 4,242,017
182 4,242,018

CLASS 409

185 4,242,019
234 4,242,020

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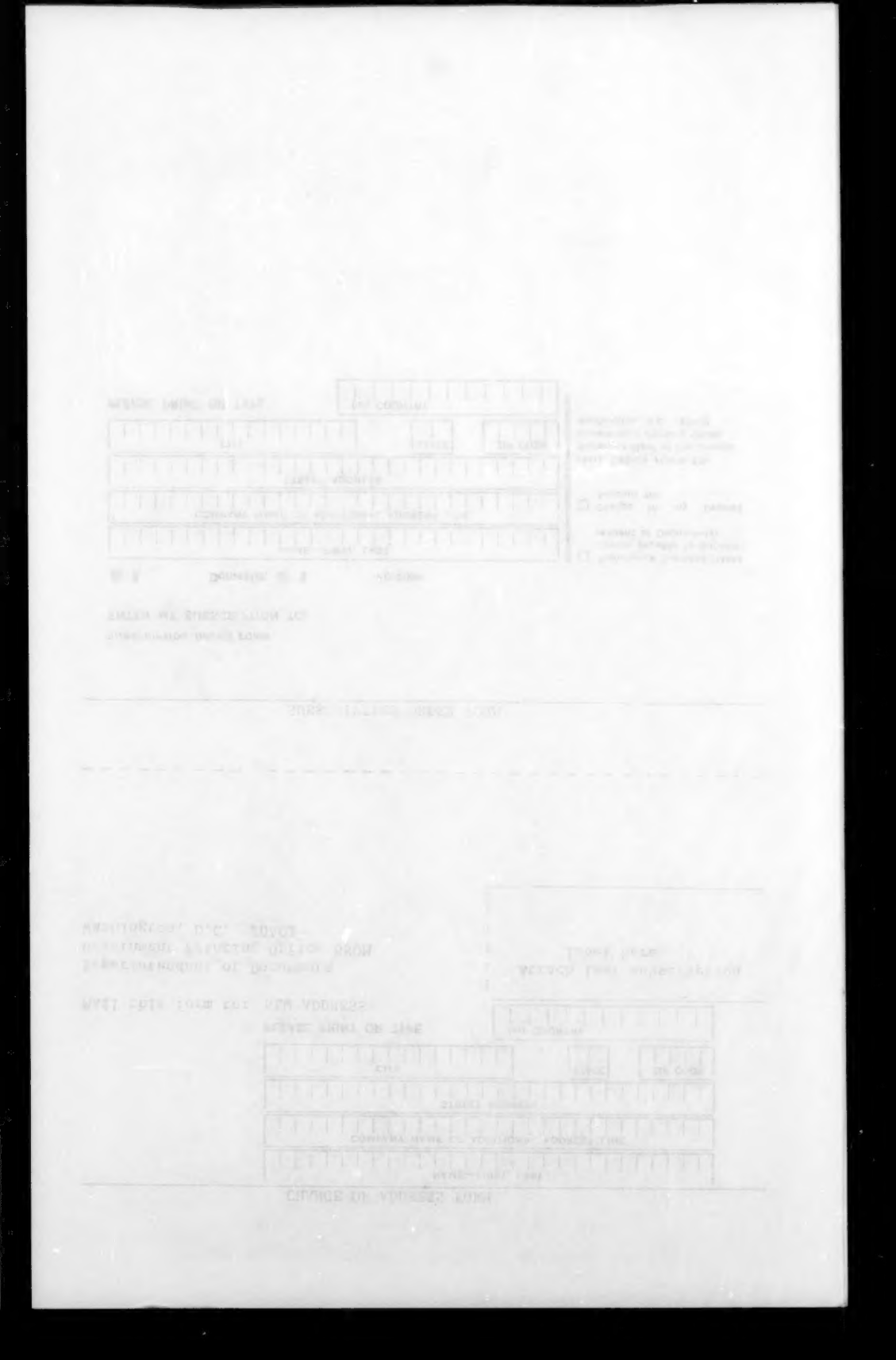

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